# MHC-EX50/EX70AV/EX90

## SERVICE MANUAL

*AEP Model*
*UK Model*
*MHC-EX50/EX70AV/EX90*

*E Model*
*MHC-EX50/EX70AV*

- MHC-EX50/EX70AV/EX90 are composed of following models. As for the service manual, it is issued for each component model, then, please refer to it.

### COMPONENTS MODEL NAME FOR MHC-EX50/EX70AV/EX90

| | MHC-EX50 | | MHC-EX70AV | | MHC-EX90 |
|---|---|---|---|---|---|
| | AEP, UK, G, IT, CIS | E, EA, SP, MY, HK, TH | AEP, UK, G, IT | E, EA, SP, MY, HK, TH | AEP, UK, IT |
| **AMPLIFIER** | TA-EX50 | | TA-EX70 | | TA-EX90 |
| **CD PLAYER** | CDP-EX100 | | | | |
| **TUNER** | ST-EX100 | | | | |
| **CASSETTE DECK** | TC-EX90 | | TC-EX100 | TC-EX90 | |
| **FRONT SPEAKER** | — | SS-EX55G | — | SS-EX55G | SA-EX100 |
| **CENTER SPEAKER** | — | — | SS-CN14 | | — |
| **REAR SPEAKER** | — | — | SS-SR12 | | — |

- Abbreviations
G : German
EA : Saudi Arabia
MY : Malaysia
HK : Hong Kong
IT : Italian
SP : Singapore
TH : Thailand

### SPECIFICATIONS

**General**

Power requirements
220-230 V AC, 50/60Hz (AEP, UK, G, IT, CIS model)
220V AC, 50/60Hz (TH model)
110-120V or 220-240V AC, 50/60Hz
Adjustable with the voltage selector
(E, EA, SP, MY, HK model)

Power consumption
145W (System)
(EX50 : E, EA, SP, MY, HK, TH model)
135W (System)
(EX50 : AEP, UK, G, IT model)
210W (System) (EX70AV model)
155W (Active speaker not included) (EX90 model)

**Supplied accessories**

AM loop aerial (1)
Remote RM-SE5 (1) (EX50/EX90 model)
RM-SE7AV (1) (EX70AV model)
Sony SUM-3 (NS) batteries (2)
FM lead aerial (1)
Flat cord (1)
Audio cords (4)
Speaker connecting cord
Feet for center speaker (4) (EX70AV model)

Design and specifications are subject to change without notice.

## MINI Hi-Fi COMPONENT SYSTEM

SONY®

## PARTS LIST

NOTE :
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Abbreviations
  - G : German model
  - IT : Italian model
  - EA : Saudi Arabia model
  - SP : Singapore model
  - MY : Malaysia model
  - TH : Thailand model
  - HK : Hong Kong model

### ACCESSORIES & PACKING MATERIALS

***************************************

|  | Part No. | Description | Remark |
|---|---|---|---|
|  | 1-473-591-11 | COMMANDER, STANDARD (RM-SE5) (EX50/EX90) |  |
| * | 1-473-592-11 | COMMANDER, STANDARD (RM-SE7AV) (EX70AV) |  |
|  | 1-501-659-41 | ANTENNA (FM) (E, EA, MY, SP, HK, TH) |  |
|  | 1-501-721-11 | ANTENNA (LOOP) |  |
|  | 1-501-807-21 | ANTENNA (FM) (AEP, UK, G, IT, CIS) |  |
|  | 1-558-271-11 | CORD, CONNECTION (AUDIO 108cm) |  |
| ⚠ | 1-765-293-11 | CORD, POWER (SA) (EX90 : AEP, G, IT) |  |
|  | 1-769-170-11 | CORD (WITH CONNECTOR) (7P) (TA-ST-TC-CDP) |  |
|  | 1-769-307-11 | CORD, SPEAKER (TA-SS) (2m) (EX50 : E, EA, SP, MY, HK, TH / EX70AV : E, EA, SP, MY, HK, TH) |  |
| ⚠ | 1-769-312-21 | CORD, POWER (SA) (EX90 : UK) |  |
|  | 1-769-433-11 | CORD, SPEAKER (SURROUND) (10m) (EX70AV) |  |
|  | 1-769-433-21 | CORD, SPEAKER (SURROUND) (2.5m) (EX70AV) |  |
|  | 1-775-512-21 | CORD, SPEAKER CONNECTION (TA-SA) (2m) (EX90) |  |
|  | 3-810-489-11 | MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50 : AEP) |  |
|  | 3-810-489-21 | MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX50 : AEP) |  |
|  | 3-810-489-31 | MANUAL, INSTRUCTION (ENGLISH) (EX50 : UK) |  |
|  | 3-810-489-41 | MANUAL, INSTRUCTION (GERMAN) (EX50 : G) |  |
|  | 3-810-489-51 | MANUAL, INSTRUCTION (ITALIAN) (EX50 : IT) |  |
|  | 3-810-489-61 | MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX50 : AEP) |  |
|  | 3-810-489-71 | MANUAL, INSTRUCTION (ENGLISH, RUSSIAN) (EX50 : CIS) |  |
|  | 3-810-489-81 | MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX50 : E, EA, MY, SP, HK,TH) |  |
|  | 3-810-489-91 | MANUAL, INSTRUCTION (ARABIC) (EX50 : EA) |  |
|  | 3-810-490-11 | MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX70AV : AEP) |  |
|  | 3-810-490-21 | MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX70AV : AEP, IT) |  |
|  | 3-810-490-31 | MANUAL, INSTRUCTION (ENGLISH) (EX70AV : UK) |  |
|  | 3-810-490-41 | MANUAL, INSTRUCTION (GERMAN) (EX70AV : G) |  |
|  | 3-810-490-51 | MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX70AV : AEP) |  |
|  | 3-810-490-61 | MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX70AV : E, EA, MY, SP, HK,TH) |  |
|  | 3-810-490-71 | MANUAL, INSTRUCTION (ARABIC) (EX70AV : EA) |  |
|  | 3-810-491-11 | MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX90 : AEP) |  |
|  | 3-810-491-21 | MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX90 : AEP,IT) |  |
|  | 3-810-491-31 | MANUAL, INSTRUCTION (ENGLISH) (EX90 : UK) |  |
|  | 3-810-491-41 | MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX90 : AEP) |  |
| * | 3-933-134-01 | CUSHION (LOWER) (TC) |  |
| * | 3-933-164-01 | CUSHION (UPPER) (TC) |  |
|  | 4-972-322-01 | FOOT (Y) (SURROUND) (EX70AV) |  |
| * | 4-972-989-01 | CUSHION (SURROUND) (EX70AV) |  |
| * | 4-979-172-01 | CUSHION (UPPER) (SA) (EX90) |  |
| * | 4-979-173-01 | CUSHION (LOWER) (SA) (EX90) |  |
| * | 4-980-537-01 | CUSHION (UPPER) (TA) |  |
| * | 4-980-538-01 | CUSHION (LOWER) (TA) |  |
| * | 4-980-539-01 | CUSHION (UPPER) (ST) |  |
| * | 4-980-540-01 | CUSHION (LOWER) (ST) |  |
| * | 4-980-541-01 | CUSHION (UPPER) (CD) |  |
| * | 4-980-542-01 | CUSHION (LOWER) (CD) |  |
| * | 4-980-544-01 | INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : E, SP, MY, HK) |  |
| * | 4-980-545-01 | INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : EA) |  |
| * | 4-980-546-01 | INDIVIDUAL CARTON (TA-TC) (EX70AV : AEP,UK,G,IT) |  |
| * | 4-980-548-01 | INDIVIDUAL CARTON (TA-TC) (EX50 : AEP,UK,G,IT,CIS) |  |
| * | 4-980-549-01 | INDIVIDUAL CARTON (TA-TC) (EX90) |  |
| * | 4-980-554-01 | INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : E, SP, MY, HK) |  |
| * | 4-980-555-01 | INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : EA) |  |
|  | 4-980-737-01 | LID, BATTERY CASE (for RM-SE5/RM-SE7AV) |  |
| * | 4-980-788-01 | CUSHION (EX) (SS) (EX50 : E,EA,SP,MY, HK,TH/EX70AV : E,EA,SP,MY,HK,TH) |  |
| * | 4-982-100-01 | INDIVIDUAL CARTON (ST-CDP) (AEP,UK,G,IT,CIS) |  |
| * | 4-982-441-01 | INDIVIDUAL CARTON (SA) (EX90) |  |
| * | 4-983-403-01 | INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : TH) |  |
| * | 4-983-404-01 | INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : TH) |  |

**Sony Corporation**
**Consumer A&V Products Company**
**Home A&V Products Div.**

English
96B090478-1
Printed in Japan
© 1996.2
Published by Home A&V Products Div. Quality Engineering Dept.

# TC-EX90/EX100

# SERVICE MANUAL

*AEP Model*
*UK Model*
*E Model*

TC-EX90 is the deck section in MHC-EX50/EX90, and TC-EX100 is the deck section in MHC-EX70AV/EX100AV.

**Photo : TC-EX100 (SILVER)**

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol ⅅ are trademarks of Dolby Laboratories Licensing Corporation.

| Model Name Using Similar Mechanism | | TC-EX5 |
|---|---|---|
| Tape Transport Mechanism Type | DECK–A | TCM-190RA12CL |
| | DECK–B | TCM-190RB52C |

## SPECIFICATIONS

Recording system
4-track 2-channel stereo
Frequency response
(DOLBY NR OFF)
40 – 13,000 Hz (±3 dB),
using Sony TYPE I cassette
40 – 14,000 Hz (±3 dB),
using Sony TYPE II cassette
40 – 15,000 Hz (±3 dB),
using Sony TYPE IV cassette
Wow and flutter
0.1% WRMS ±0.3% (DIN)
Dimensions
Approx. 280 x 122.5 x 280 mm
(11 1/8 x 4 7/8 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls
Mass Approx. 2.8 kg
(6 lb 2 oz)

MICROFILM

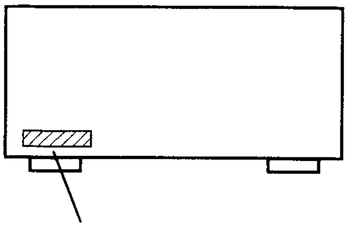
*MC-Service*

## STEREO CASSETTE DECK

SONY®

## MODEL IDENTIFICATION

— BACK PANEL —



| | |
|---|---|
| TC-EX100 (AEP, UK Model) | : 4-978-260-0□ |
| TC-EX100 (E Model) | : 4-978-260-1□ |
| TC-EX100 (Saudi Arabia Model) | : 4-978-260-2□ |
| TC-EX100 (Thailand Model) | : 4-978-260-3□ |
| TC-EX90 (AEP, UK Model) | : 4-978-260-4□ |
| TC-EX90 (E Model) | : 4-978-260-5□ |
| TC-EX90 (Saudi Arabia Model) | : 4-978-260-6□ |
| TC-EX90 (Thailand Model) | : 4-978-260-7□ |

### Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

**SAFETY-RELATED COMPONENT WARNING !!**

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

## TABLE OF CONTENTS

Section Title Page

SECTION 1. SERVICE NOTE .......... 3

SECTION 2. GENERAL .......... 4

SECTION 3. DISASSEMBLY

3-1. Case and Back Panel .......... 5
3-2. TC Main Board .......... 5
3-3. Front Panel ASSY .......... 6
3-4. TC Mechanism Deck .......... 6

SECTION 4. ADJUSTMENTS

4-1. Mechanical Adjustments .......... 7
4-2. Electrical Adjustments .......... 7
Test Mode .......... 7
Record/Playback Head Azimuth Adjustment
Deck-A Deck-B .......... 7
Tape Speed Adjustment Deck-A Deck-B .......... 8
Playback Level Adjustment Deck-A Deck-B .......... 8
Record Bias Adjustment Deck-B .......... 9
Record Level Adjustment Deck-B .......... 9

SECTION 5. DIAGRAMS

5-1. IC Pin Function
• IC104 M38123M4-118FP System Controller
(TC Main Board) .......... 10
5-2. Circuit Boards Location .......... 12
5-3. Printed Wiring Board — Audio Section — .......... 13
5-4. Schematic Diagram — Audio Section — .......... 15
5-5. Printed Wiring Board — TC Section — .......... 17
5-6. Schematic Diagram — TC Section — .......... 19
5-7. IC Block Diagrams .......... 23

SECTION 6. EXPLODED VIEWS

6-1. Chassis Section .......... 24
6-2. Front Panel Section .......... 25
6-3. Mechanism Section-1
(Deck A : TCM-190RA12CL)
(Deck B : TCM-190RB52C) .......... 26
6-4. Mechanism Section-2
(Deck A : TCM-190RA12CL)
(Deck B : TCM-190RB52C) .......... 27

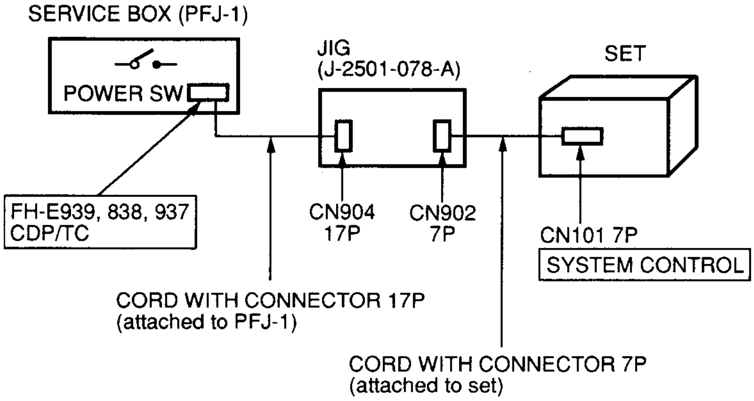
SECTION 7. ELECTRICAL PARTS LIST .......... 28

# SECTION 1

# SERVICING NOTE

### How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.


SERVICE BOX (PFJ-1)
POWER SW
FH-E939, 838, 937
CDP/TC
JIG
(J-2501-078-A)
CN904
17P
CN902
7P
SET
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

### [Tune light on all LED]

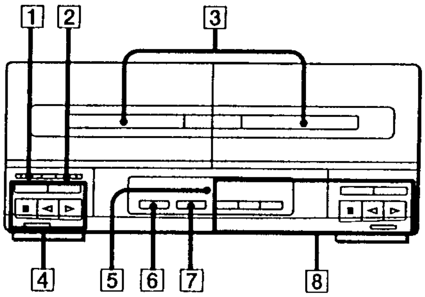
Push ■ button of DECK A and ○ REC MUTE button at the same time. then, all segments of LED turn on the light.
To cancel the mode, push ■ button of DECK A and ○ REC MUTE button at the same time again.

# SECTION 2
# GENERAL

This section is extracted from instruction manual.

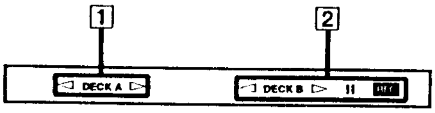
## Index to Parts and Controls

### Front Panel



1 DOLBY NR selector (15)
2 DIRECTION MODE selector (14)
3 Cassette compartments (14)
4 Tape operating buttons (for deck A)
  ▷ (front side play) (14)
  ◁ (reverse side play) (14)
  ■ (stop) (14)
  ▶▶ (fast rightward and AMS**) (14)
  ◀◀ (fast leftward and AMS**) (14)
  ⏏ (eject) (14)
5 Display window
6 CD SYNC button (15)
7 DUBBING MODE button (19)
8 Tape operating buttons (for deck B)
  ▷ (front side play) (14)
  ◁ (reverse side play) (14)
  ■ (stop) (14)
  ▶▶ (fast rightward and AMS**) (14)
  ◀◀ (fast leftward and AMS**) (14)
  II PAUSE (14)
  ○ REC MUTE (16)
  ● REC (recording) (16)
  ⏏ (eject) (14)
  **AMS: Automatic Music Sensor (14)

### Display Window



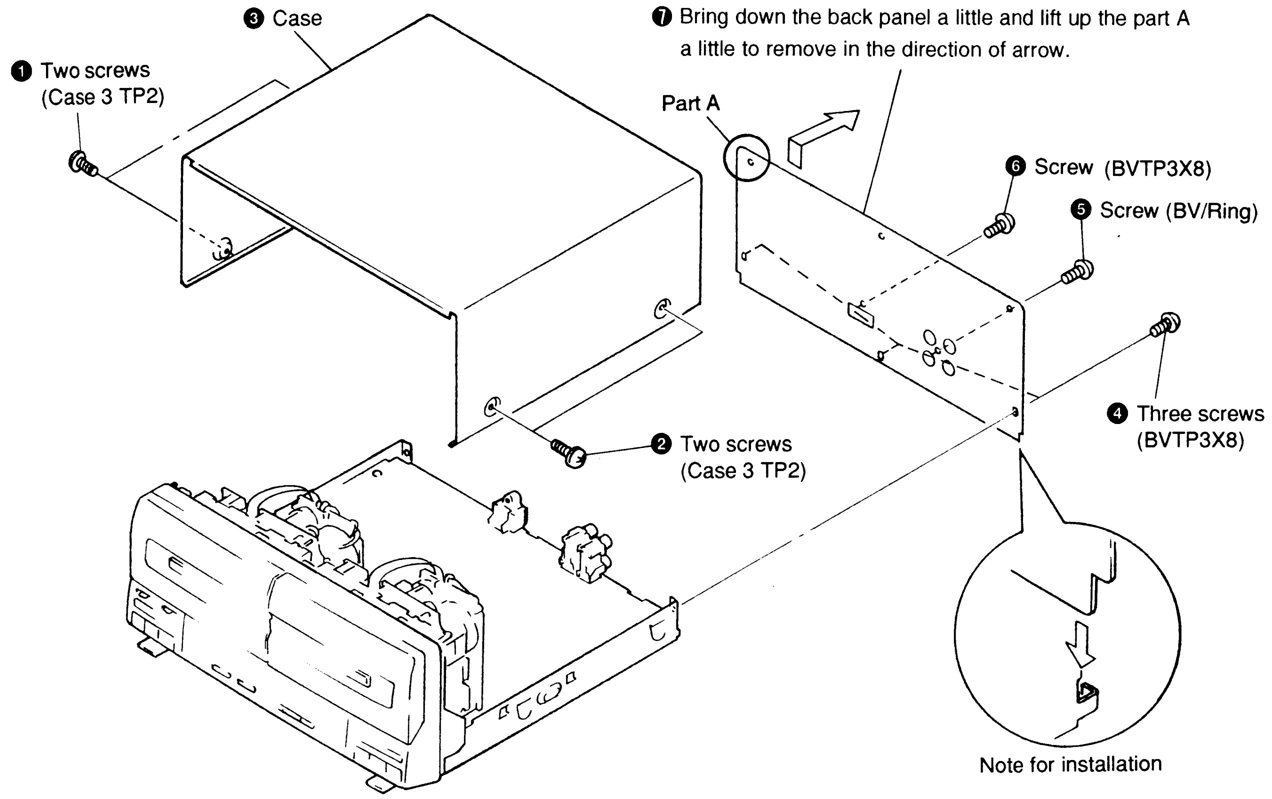
1 Deck A status indication
2 Deck B status indication

MC-Service

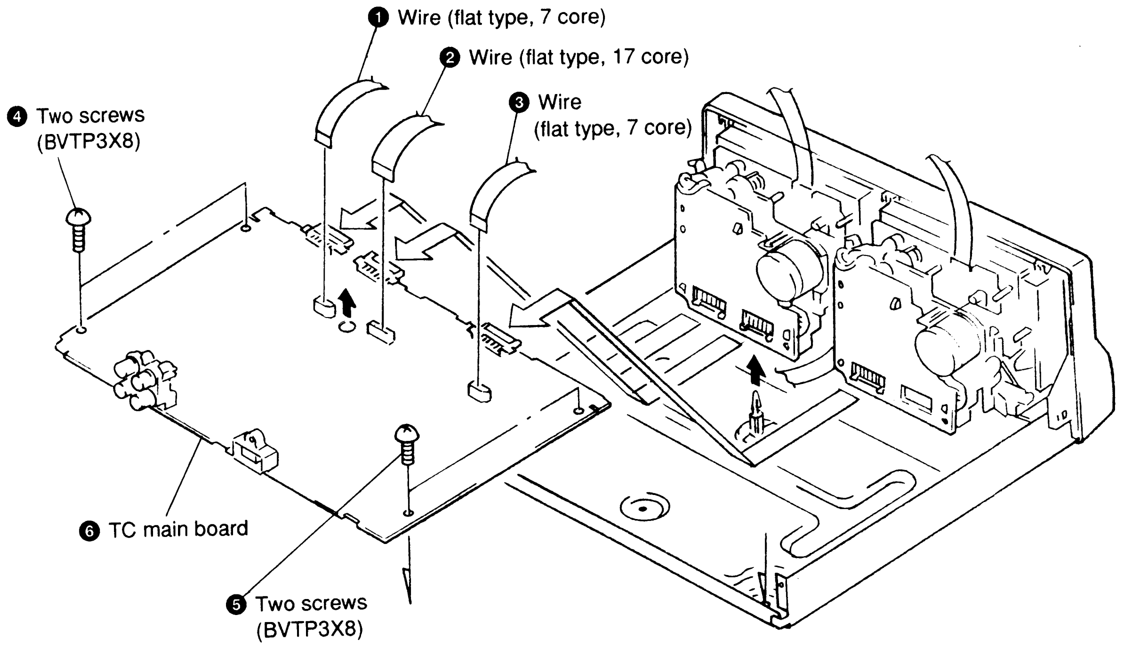
# SECTION 3
# DISASSEMBLY

**Note :** Follow the disassembly procedure in the numerical order given.

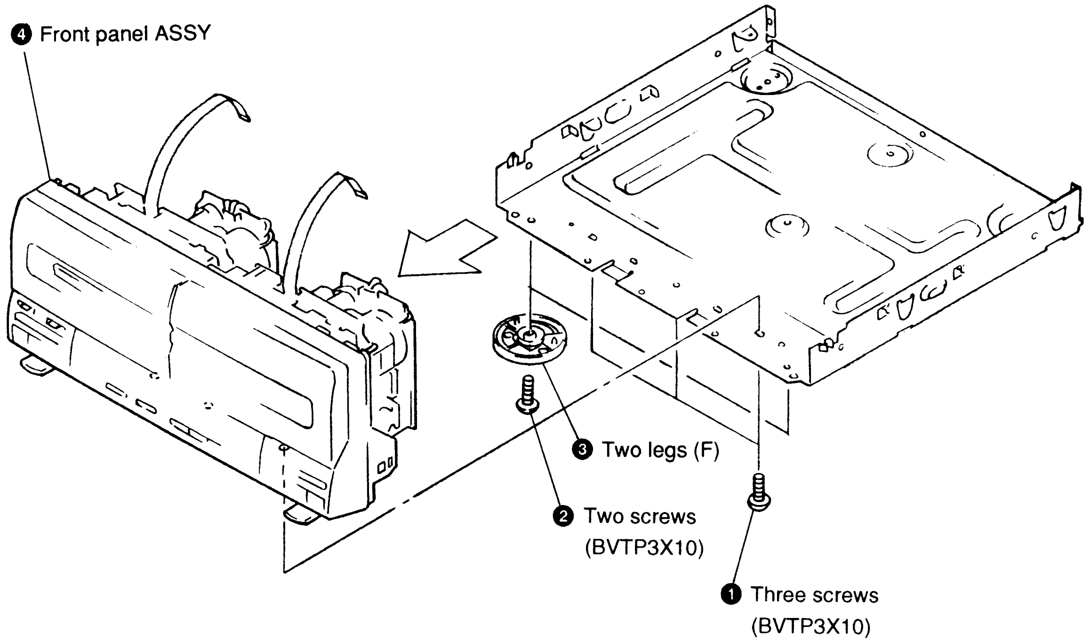
## 3-1. CASE AND BACK PANEL


❶ Two screws (Case 3 TP2)
❷ Two screws (Case 3 TP2)
❸ Case
❹ Three screws (BVTP3X8)
❺ Screw (BV/Ring)
❻ Screw (BVTP3X8)
❼ Bring down the back panel a little and lift up the part A a little to remove in the direction of arrow.
Part A
Note for installation

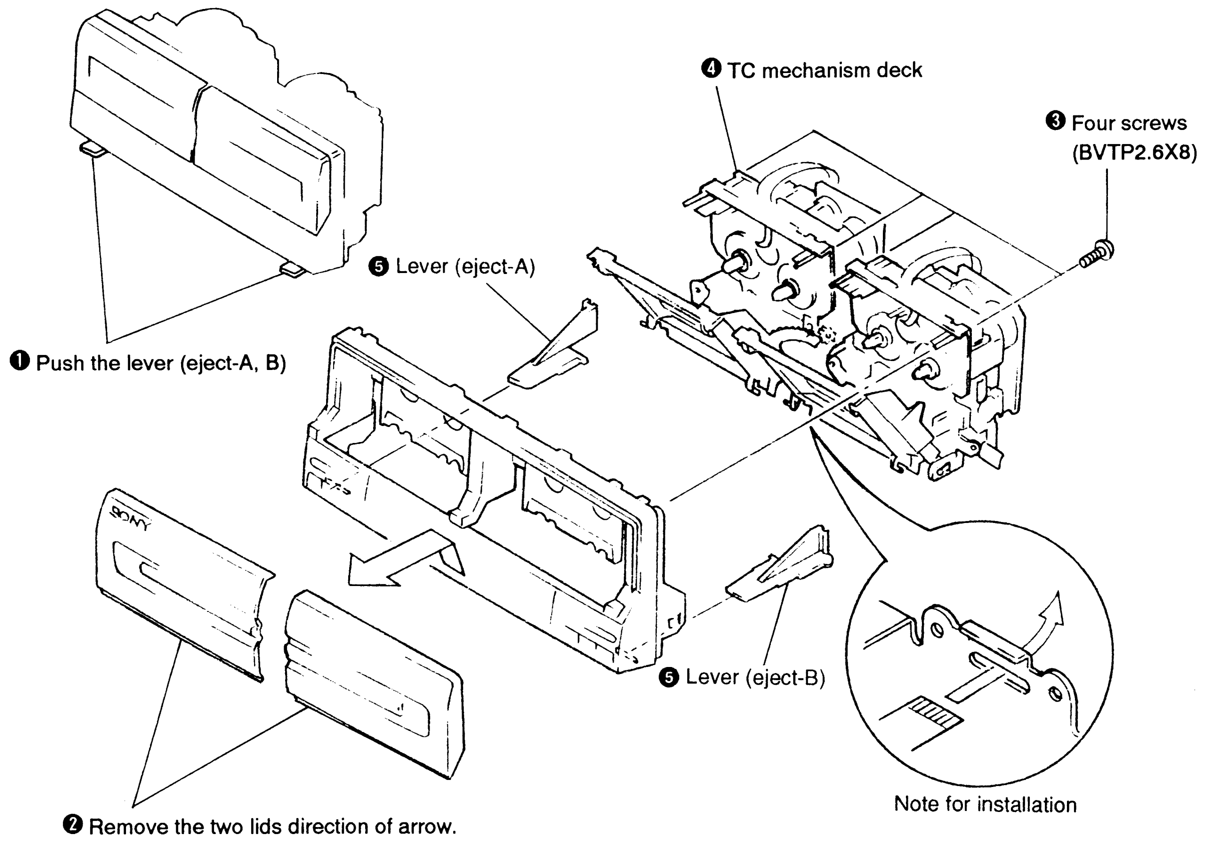
## 3-2. TC MAIN BOARD


❶ Wire (flat type, 7 core)
❷ Wire (flat type, 17 core)
❸ Wire (flat type, 7 core)
❹ Two screws (BVTP3X8)
❺ Two screws (BVTP3X8)
❻ TC main board

## 3-3. FRONT PANEL ASSY


❶ Three screws (BVTP3X10)
❷ Two screws (BVTP3X10)
❸ Two legs (F)
❹ Front panel ASSY

## 3-4. TC MECHANISM DECK


❶ Push the lever (eject-A, B)
❷ Remove the two lids direction of arrow.
❸ Four screws (BVTP2.6X8)
❹ TC mechanism deck
❺ Lever (eject-A)
❺ Lever (eject-B)
SONY
Note for installation

# SECTION 4
# ADJUSTMENTS

## 4-1. MECHANICAL ADJUSTMENTS

### PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab :
   record/playback/erase head    pinch roller
   rubber belts    capstan
2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustment.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

**Torque Measurement**

| Torque | Torque meter | Meter reading |
|---|---|---|
| Forward | CQ-102C | 30 to 60 g • cm<br>(0.42 to 0.83 oz • inch) |
| Forward<br>Back tension | CQ-102C | 1 to 5 g • cm<br>(0.014 to 0.069 oz • inch) |
| Reverse | CQ-102RC | 30 to 60 g • cm<br>(0.42 to 0.83 oz • inch) |
| Reverse<br>Back tension | CQ-102RC | 1 to 5 g • cm<br>(0.014 to 0.069 oz • inch) |
| FF, REW | CQ-201B | 65 to 90 g • cm<br>(0.91 to 1.25 oz • inch) |

**Tape Tension Measurement**

| Torque meter | Meter reading |
|---|---|
| CQ-403A | more than 110 g (more than 3.88 oz) |

## 4-2. ELECTRICAL ADJUSTMENTS

### PRECAUTION

1. The adjustment should be performed in the publication. (Be sure to male playback adjustment at first.)
2. The adjustments and measurement should be performed for both L-CH and R-CH.
   - Switche position
     DOLBY NR switch    : OFF
     DIRECTION MODE switch    : ⇆

**Test Tape**

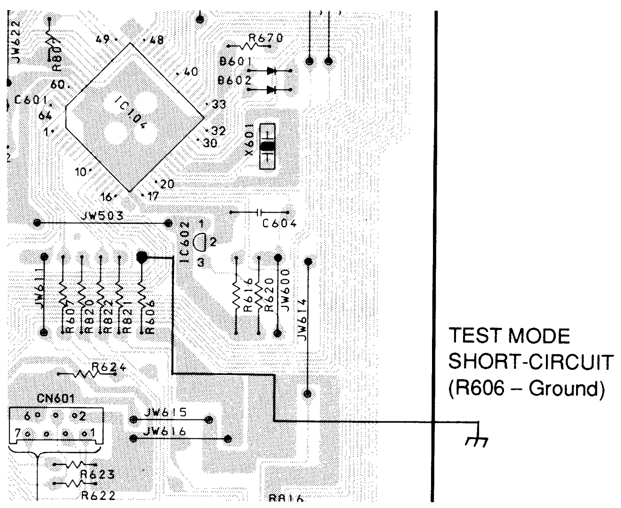
| Tape | Contents | Use |
|---|---|---|
| P-4-A100 | 10 kH, −10 dB | Azimuth Adjustment |
| P-4-L300 | 315 Hz, 0 dB | PB Level Adjustment |
| WS-48B | 3 kHz, 0 dB | Tape Speed Adjustment |

**0dB = 0.775V**

**Test mode**

1. If the power supply is TA-EX50/EX70/EX90/EX100. (When AU BUS is alive)
   ① Short-circuit following portion (R606 – Ground) on the TC MAIN board.
   ② Turn the POWER on.
   ③ Open the short-circuit to release test mode.

**[TC MAIN BOARD]**



TEST MODE
SHORT-CIRCUIT
(R606 – Ground)
IC604
JW503
C604
IC602
R624
CN601
JW615
JW616
R623
R622

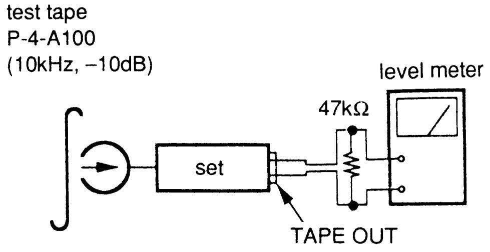
2. If the power supply is a jig.
   Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.

**Record/Playback Head Azimuth Adjustment** **DECK-A** **DECK-B**

**Note :** Perform this adjustment for both decks.

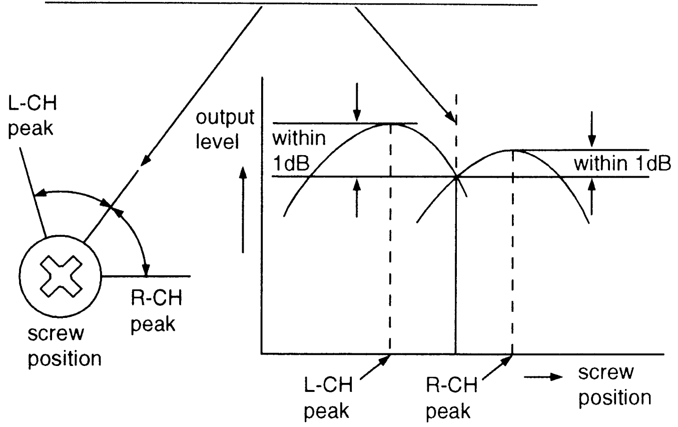
**Procedure :**

1. Mode : Forward playback



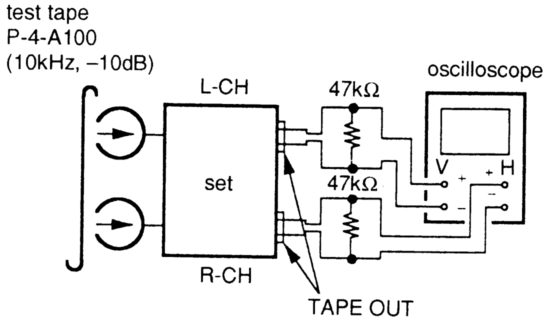
test tape
P-4-A100
(10kHz, −10dB)
level meter
47kΩ
set
TAPE OUT

2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.

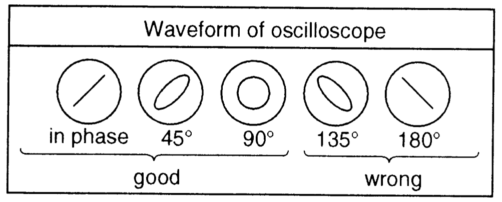


L-CH peak
output level
within 1dB
within 1dB
R-CH peak
screw position
L-CH peak
R-CH peak
screw position

3. Mode : Playback



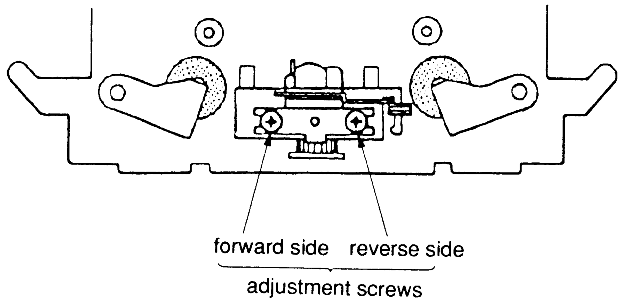
test tape
P-4-A100
(10kHz, −10dB)
L-CH
47kΩ
oscilloscope
set
47kΩ
V
H
R-CH
TAPE OUT



Waveform of oscilloscope
in phase
45°
90°
135°
180°
good
wrong

4. Change the reveres playback mode and repeat the steps 1 to 3.
5. After the adjustment, lock the adjustment screws with suitable locking compound.

**Adjustment Location :** — Record/Playback head —

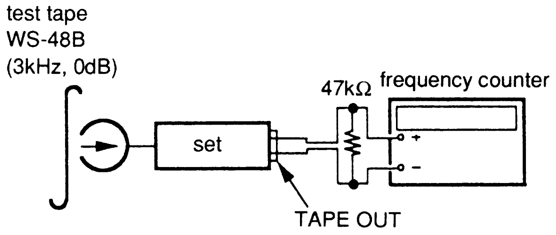


forward side
reverse side
adjustment screws

**Note :** To adjust Azimuth, after take off WINDOW ASSY, ILLUMINATOR and LID ASSY CASSETTE of FRONT PANEL.

**Tape Speed Adjustment** **DECK-A** **DECK-B**

**Procedure :**
Mode : Forward Playback



test tape
WS-48B
(3kHz, 0dB)
47kΩ
frequency counter
set
+
−
TAPE OUT

(high speed adjustment)
1. Set to FWD playback mode.
2. Press the DUBBING MODE button at HIGH position.
3. Adjust RV72 so that the frequency counter reading becomes 6,000 ± 60 Hz.

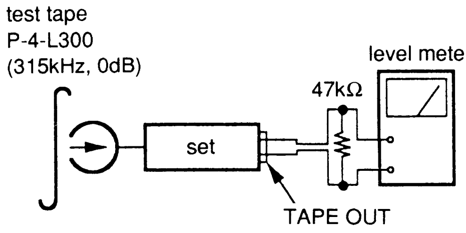
(normal speed adjustment)
1. Set to FWD playback mode.
2. Set the DUBBING MODE button to NORMAL.
3. Adjust RV71 so that the frequency counter reading becomes 3,000 ± 30 Hz.

Frequency difference between the deck A and deck B the beginning of the tape should be within ± 1%.

**Adjustment Location :** AUDIO board. (See page 9)

**Playback Level Adjustment** **DECK-A** **DECK-B**

**Procedure :**
Mode : Forward Playback



test tape
P-4-L300
(315kHz, 0dB)
level meter
47kΩ
set
TAPE OUT

Adjust RV11 (L-CH) and RV21 (R-CH), so the level meter reading becomes the adjustment Level below.

**Adjustment Level :**
TAPE OUT level : −7.4 ± 1 dB (0.294 to 0.37 V)

Level difference between channels : within 0.5 dB.

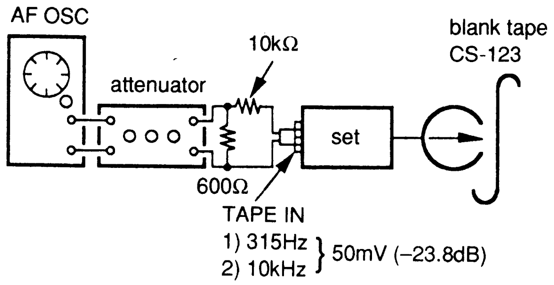
Confirm the TAPE OUT level does not change in playback mode while changing the mode from plaback to stop several times.

**AdjustmentLocation :** AUDIO board. (See page 9)

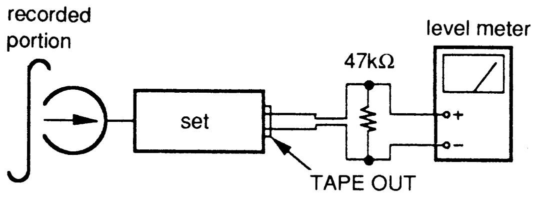
### Record Bias Adjustment DECK-B

**Procedure :**

1. Mode : Record


AF OSC
attenuator
10kΩ
600Ω
set
blank tape
CS-123
TAPE IN
1) 315Hz
2) 10kHz
50mV (–23.8dB)

2. Mode : Playback

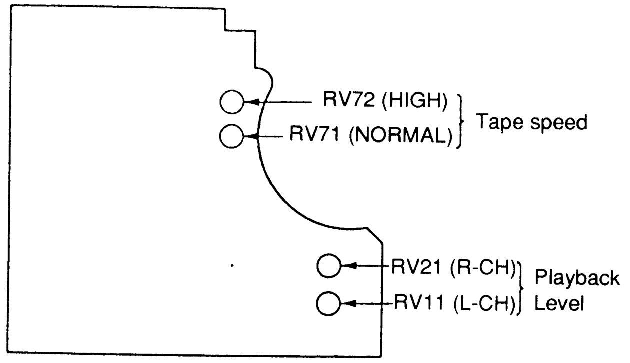

recorded
portion
set
47kΩ
level meter
TAPE OUT

Confirm that the 10 kHz playback output is 0 ± 0.5 dB relative to the 315 Hz output. If necessary, adjust RV12 (L-CH), RV22 (R-CH) and repeat the steps given adove.

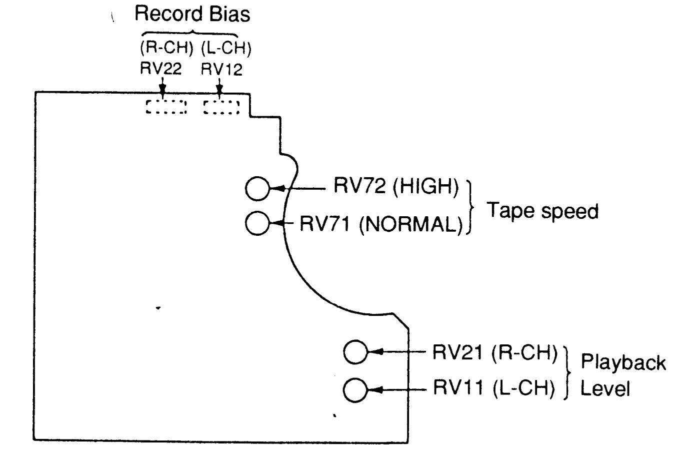
**Adjustment Location :** AUDIO board. (See page 9)

— Adjustment Parts Location Diagrams —

**DECK A :**
**[MAIN BOARD]** — Conductor side —


RV72 (HIGH)
RV71 (NORMAL)
Tape speed
RV21 (R-CH)
RV11 (L-CH)
Playback
Level

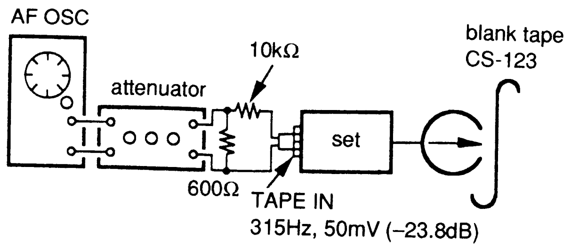
**DECK B :**
**[AUDIO BOARD]** — Conductor side —


Record Bias
(R-CH) (L-CH)
RV22 RV12
RV72 (HIGH)
RV71 (NORMAL)
Tape speed
RV21 (R-CH)
RV11 (L-CH)
Playback
Level

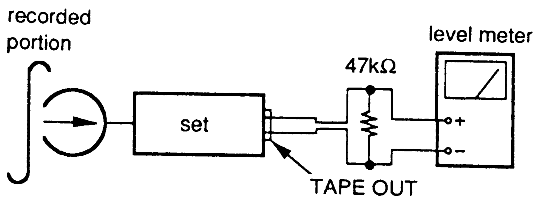
### Record Level Adjustment DECK-B

**Procedure :**

1. Mode : Record


AF OSC
attenuator
10kΩ
600Ω
set
blank tape
CS-123
TAPE IN
315Hz, 50mV (–23.8dB)

2. Mode : Playback

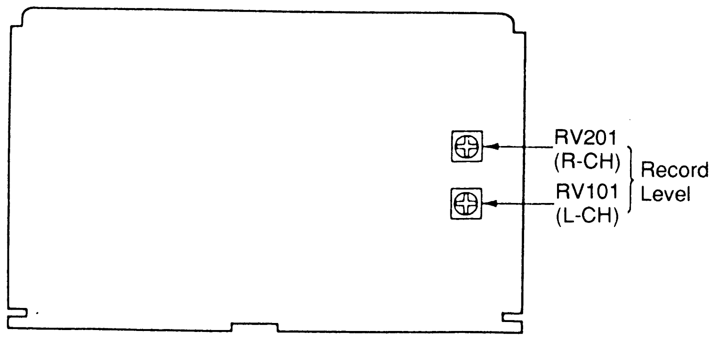

recorded
portion
set
47kΩ
level meter
TAPE OUT

Confirm playback the tape recorded become adjustment level as follows.
If necessary, adjust RV101 (L-CH), RV201 (R-CH) and repeat the steps 1 and 2.

**Adjustment level :**
TAPE OUT level : –23.8 ± 0.5 dB (47.2 to 53 mV)

**Adjustment Location :** TC MAIN board. (See page 9)

**[TC MAIN BOARD]** — Component side —


RV201
(R-CH)
RV101
(L-CH)
Record
Level

# SECTION 5
# DIAGRAMS

## 5-1. IC PIN FUNCTION

- **IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)**

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 1 | B HALF | I | B Half detection input. "L": Presence "H": Nothing |
| 2 | KEY 3 | I | Key input. (A/D converter analog input) |
| 3 | KEY 2 | I | |
| 4 | KEY 1 | I | |
| 5 | TEST | I | Electrical adjustment test mode setting. "L": Test mode |
| 6 | DISP RST | O | GND |
| 7 | DISP SYNC | O | |
| 8 | DISP CLK | O | |
| 9 | DISP OUT | O | |
| 10 | DISP IN | O | |
| 11 | B REEL 2 | O | Deck B reel motor control output. |
| 12 | B REEL 3 | O | |
| 13 | B REEL 1 | O | |
| 14 | A REEL 1 | O | Deck A reel motor control output. |
| 15 | A REEL 3 | O | |
| 16 | A REEL 2 | O | |
| 17 | PWR IN | I | +5V power supply input. |
| 18 | AUB IN | I | Audio bus input. |
| 19 | NRST | I | Microcomputer reset input. |
| 20 | AUB OUT | O | Audio bus output. |
| 21 | XC OUT | O | Not used. (GND) |
| 22 | X IN | I | Oscillator connection pins. (4 MHz) |
| 23 | X OUT | O | |
| 24 | Vss | – | GND |
| 25 | VER | – | |
| 26 | PWR OUT | O | Not used. (Open) |
| 27 | LINE MUTE | O | Line mute ON/OFF. "L": ON |
| 28 | BIAS | O | Bias oscillation control output. "L": ON |
| 29 | NC | – | GND |
| 30 | DAT FUNC | O | DAT mute output. |
| 31 | CD FUNC | O | CD mute output. |
| 32 | PASS | O | PASS amplifier switch output to dolby. |
| 33 | EQ H/L | O | REC equalizer switching output. "L": High speed "H": Normal speed |
| 34 | REC MUTE | O | REC mute output. |
| 35 | PB SEL | O | Play mode deck A/B select output. "L": DECK A "H": DECK B |
| 36 | AMS G SEL | O | AMS/BS mode select output. "H": AMS mode "L": BS mode |
| 37 | 1599 MUTE | O | Mute output to IC101 (CXA1599Q). "H": ON "L": OFF |
| 38 | NC | – | Not used. (+5V) |
| 39 | NR RELAY | O | ALC (Automatic Level Control) control output. |
| 40 | CD SYNC | O | CD synchro dubbing LED output. "H": ON "L": OFF |

| | FF | TRIG | STOP | FWD |
|---|---|---|---|---|
| REEL 1 | H | L | L | H |
| REEL 2 | L | H | L | L |
| REEL 3 | H | H | L | L |

| Pin No. | |
|---|---|
| 41 | DUB |
| 42 | DUB |
| 43 | PAU |
| 44 | REC |
| 45 | B◁ |
| 46 | B▷ |
| 47 | A◁ |
| 48 | A▷ |
| 49 | B ST |
| 50 | A ST |
| 51 | +7.5 |
| 52 | REL |
| 53 | REC |
| 54 | CAP |
| 55 | B CA |
| 56 | A CA |
| 57 | VDD |
| 58 | VEE |
| 59 | AVs |
| 60 | VREF |
| 61 | A H |
| 62 | BS. |
| 63 | AS. |
| 64 | AMS |

lank tape
S-123

meter

ent level as

and repeat

53 mV)

e 9)

RV201
(R-CH)
RV101
(L-CH)
Record
Level

# SECTION 5
# DIAGRAMS

## 5-1. IC PIN FUNCTION

**• IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)**

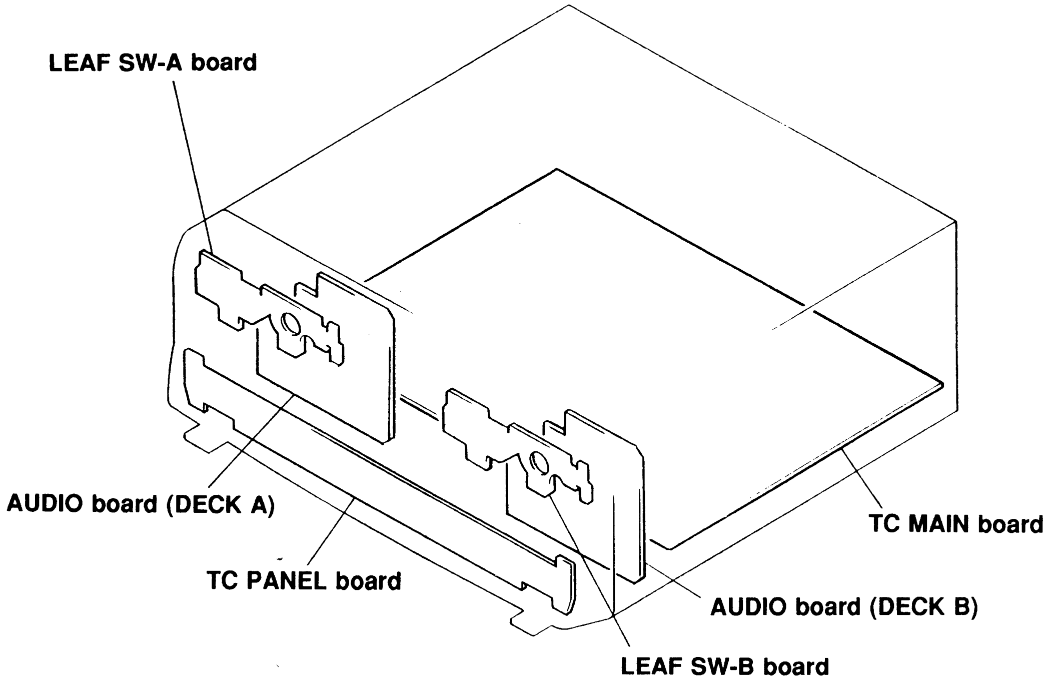
| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 1 | B HALF | I | B Half detection input. "L": Presence "H": Nothing |
| 2 | KEY 3 | I | Key input. (A/D converter analog input) |
| 3 | KEY 2 | I | |
| 4 | KEY 1 | I | |
| 5 | TEST | I | Electrical adjustment test mode setting. "L": Test mode |
| 6 | DISP RST | O | GND |
| 7 | DISP SYNC | O | |
| 8 | DISP CLK | O | |
| 9 | DISP OUT | O | |
| 10 | DISP IN | O | |
| 11 | B REEL 2 | O | Deck B reel motor control output. |
| 12 | B REEL 3 | O | |
| 13 | B REEL 1 | O | |
| 14 | A REEL 1 | O | Deck A reel motor control output. |
| 15 | A REEL 3 | O | |
| 16 | A REEL 2 | O | |
| 17 | PWR IN | I | +5V power supply input. |
| 18 | AUB IN | I | Audio bus input. |
| 19 | NRST | I | Microcomputer reset input. |
| 20 | AUB OUT | O | Audio bus output. |
| 21 | XC OUT | O | Not used. (GND) |
| 22 | X IN | I | Oscillator connection pins. (4 MHz) |
| 23 | X OUT | O | |
| 24 | Vss | – | GND |
| 25 | VER | – | |
| 26 | PWR OUT | O | Not used. (Open) |
| 27 | LINE MUTE | O | Line mute ON/OFF. "L": ON |
| 28 | BIAS | O | Bias oscillation control output. "L": ON |
| 29 | NC | – | GND |
| 30 | DAT FUNC | O | DAT mute output. |
| 31 | CD FUNC | O | CD mute output. |
| 32 | PASS | O | PASS amplifier switch output to dolby. |
| 33 | EQ H/L | O | REC equalizer switching output. "L": High speed "H": Normal speed |
| 34 | REC MUTE | O | REC mute output. |
| 35 | PB SEL | O | Play mode deck A/B select output. "L": DECK A "H": DECK B |
| 36 | AMS G SEL | O | AMS/BS mode select output. "H": AMS mode "L": BS mode |
| 37 | 1599 MUTE | O | Mute output to IC101 (CXA1599Q). "H": ON "L": OFF |
| 38 | NC | – | Not used. (+5V) |
| 39 | NR RELAY | O | ALC (Automatic Level Control) control output. |
| 40 | CD SYNC | O | CD synchro dubbing LED output. "H": ON "L": OFF |

| | FF | TRIG | STOP | FWD |
|---|---|---|---|---|
| REEL 1 | H | L | L | H |
| REEL 2 | L | H | L | L |
| REEL 3 | H | H | L | L |

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 41 | DUB H | O | High speed dubbing LED output. "H": ON "L": OFF |
| 42 | DUB N | O | Normal speed dubbing LED output. "H": ON "L": OFF |
| 43 | PAUSE | O | PAUSE LED output. "H": ON "L": OFF |
| 44 | REC | O | REC LED output. "H": ON "L": OFF |
| 45 | B◁ | O | Deck B REV LED output. "H": ON "L": OFF |
| 46 | B▷ | O | Deck B FWD LED output. "H": ON "L": OFF |
| 47 | A◁ | O | Deck A REV LED output. "H": ON "L": OFF |
| 48 | A▷ | O | Deck A FWD LED output. "H": ON "L": OFF |
| 49 | B STOP SW | I | Deck B stop detect input. "H": STOP |
| 50 | A STOP SW | I | Deck A stop detect input. "H": STOP |
| 51 | +7.5V DET | I | +7.5V power supply detect input. |
| 52 | RELAY | O | Control output to REC/PB select output. "H": REC "L": PLAY |
| 53 | REC/PB | O | Dolby IC (IC103) REC/PB select output. "H": REC "L": PLAY |
| 54 | CAP. MOT H/L | O | Capstan motor HIGH/LOW select output. "H": HIGH "L": LOW |
| 55 | B CAP. MOTOR | O | Deck B capstan motor control output. "H": ON "L": OFF |
| 56 | A CAP. MOTOR | O | Deck A capstan motor control output. "H": ON "L": OFF |
| 57 | VDD | – | +5V power supply. |
| 58 | VEE | – | GND |
| 59 | AVSS | – | |
| 60 | VREF | I | A/D converter reference power supply +5V. |
| 61 | A HALF | I | Deck A half detect input. |
| 62 | BS. REEL IN | I | Deck B reel table signal input. |
| 63 | AS. REEL IN | I | Deck A reel table signal input. |
| 64 | AMS IN | I | AMS input. "L": No song "H": Song |

MC-Service

## 5-2. CIRCUIT BOARDS LOCATION

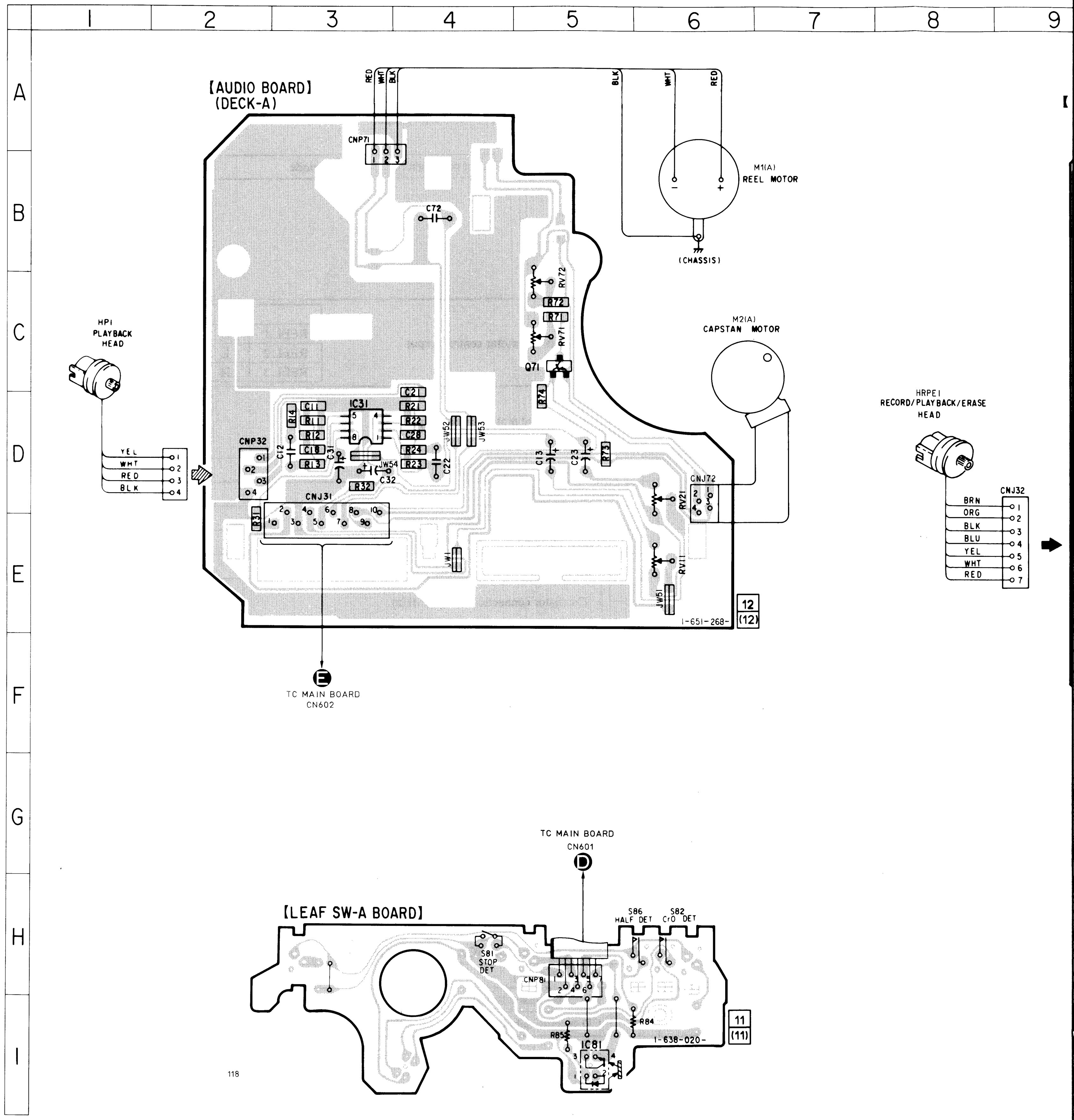

LEAF SW-A board
AUDIO board (DECK A)
TC PANEL board
TC MAIN board
AUDIO board (DECK B)
LEAF SW-B board

- **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| IC31 (DECK A) | D-3 |
| IC31 (DECK B) | D-10 |
| IC32 | D-11 |
| IC81 (DECK A) | I-5 |
| IC81 (DECK B) | I-13 |
| Q51 | C-11 |
| Q52 | B-11 |
| Q53 | C-11 |
| Q71 (DECK A) | C-5 |
| Q71 (DECK B) | D-13 |

**Note:**
- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ▨ : Pattern from the side which enable seeing.

## 5-3. PRINTED WIRING BOARD — AUDIO SECTION —


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
[AUDIO BOARD]
(DECK-A)
RED
WHT
BLK
CNP71
1 2 3
C72
M1(A)
REEL MOTOR
(CHASSIS)
RV72
R72
R71
RV71
Q71
R74
HP1
PLAYBACK
HEAD
YEL
WHT
RED
BLK
CNP32
C11
R11
R12
C18
R13
R14
C12
C31
IC31
C32
JW54
R32
C21
R21
R22
C28
R24
R23
C22
JW52
JW53
C13
C23
R73
CNJ31
R31
JW1
M2(A)
CAPSTAN MOTOR
CNJ72
RV21
RV11
JW51
1-651-268-
12
(12)
HRPE1
RECORD/PLAYBACK/ERASE
HEAD
CNJ32
BRN
ORG
BLK
BLU
YEL
WHT
RED
E
TC MAIN BOARD
CN602
TC MAIN BOARD
CN601
D
[LEAF SW-A BOARD]
S81
STOP
DET
CNP81
S86
HALF DET
S82
CrO DET
R84
R85
IC81
1-638-020-
11
(11)
118

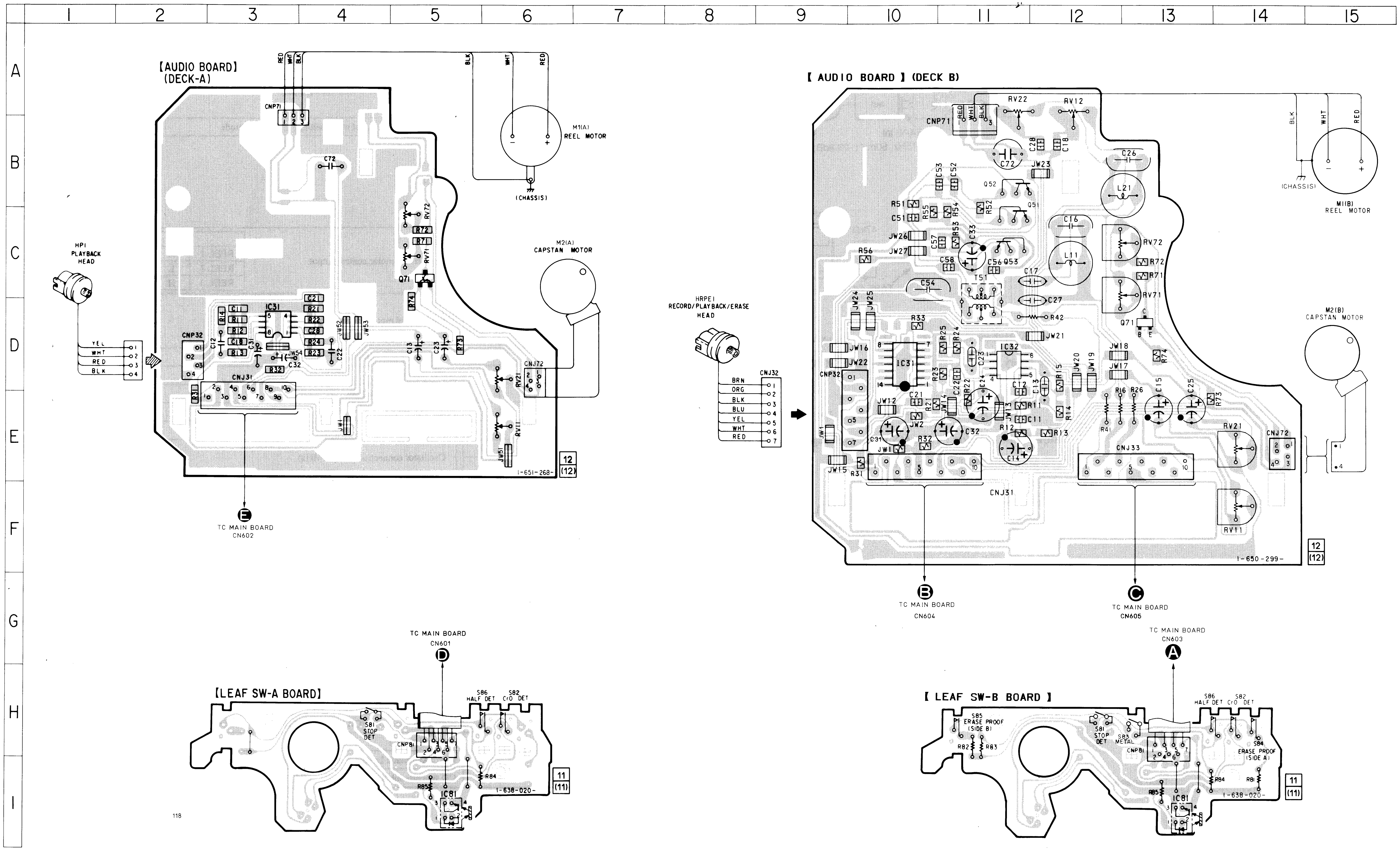
MC-Service

onductor
on

| o. | Location |
|---|---|
| CK A) | D-3 |
| CK B) | D-10 |
|  | D-11 |
| CK A) | I-5 |
| CK B) | I-13 |
|  | C-11 |
|  | B-11 |
|  | C-11 |
| CK A) | C-5 |
| CK B) | D-13 |

onent side.
uctor side.
nable seeing.

## 5-3. PRINTED WIRING BOARD — AUDIO SECTION —



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13
14
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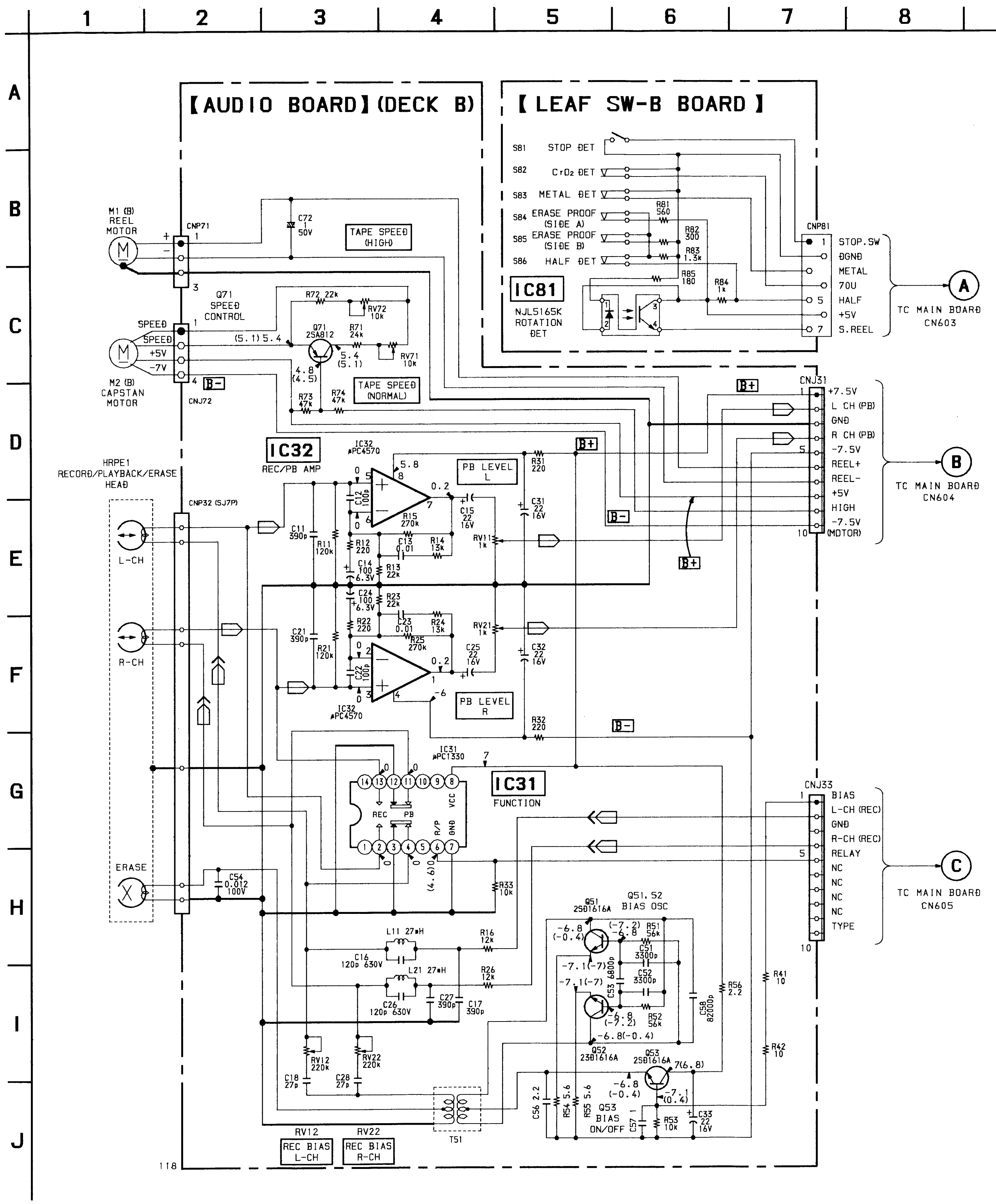
A
B
C
D
E
F
G
H
I
[AUDIO BOARD] (DECK-A)
CNP71
RED
WHT
BLK
M1(A) REEL MOTOR
(CHASSIS)
C72
RV72
R72
R71
RV71
Q71
R74
M2(A) CAPSTAN MOTOR
HP1 PLAYBACK HEAD
YEL
WHT
RED
BLK
CNP32
C12
R14
C11
R11
R12
C18
R13
IC31
C31
C32
R32
JW54
C21
R21
R22
C28
R24
R23
C22
JW52
JW53
C13
C23
R73
CNJ31
R31
CNJ72
RV21
JW1
RV11
JW51
12
(12)
1-651-268-
E
TC MAIN BOARD CN602
[AUDIO BOARD] (DECK B)
CNP71
RV22
RV12
C28
C18
C72
JW23
C26
C53
C52
Q52
R51
C51
R55
R54
R52
Q51
L21
C16
JW26
JW27
C57
R53
C33
C56
Q53
C58
L11
RV72
R72
R71
RV71
R56
C54
T51
C17
C27
R42
JW24
JW25
R33
R25
R24
Q71
JW16
JW22
CNP32
IC31
IC32
C23
C24
R23
C22
R22
JW21
JW20
JW19
JW18
JW17
R15
R74
JW12
C21
R21
JW14
JW13
C12
C13
R11
C11
R16
R26
C15
C25
R73
JW2
C31
JW1
R32
C32
R12
C14
R13
R14
R41
RV21
CNJ72
CNJ33
JW15
R31
CNJ31
RV11
12
(12)
1-650-299-
HRPE1 RECORD/PLAYBACK/ERASE HEAD
CNJ32
BRN
ORG
BLK
BLU
YEL
WHT
RED
BLK
WHT
RED
(CHASSIS)
M1(B) REEL MOTOR
M2(B) CAPSTAN MOTOR
B
TC MAIN BOARD CN604
C
TC MAIN BOARD CN605
TC MAIN BOARD CN601
D
[LEAF SW-A BOARD]
S81 STOP DET
S86 HALF DET
S82 CrO DET
CNP81
R84
R85
IC81
11
(11)
1-638-020-
118
TC MAIN BOARD CN603
A
[LEAF SW-B BOARD]
S85 ERASE PROOF (SIDE B)
R82
R83
S81 STOP DET
S83 METAL
S86 HALF DET
S82 CrO DET
S84 ERASE PROOF (SIDE A)
CNP81
R84
R81
R85
IC81
11
(11)
1-638-020-

MC-Service

## 5-4. SCHEMATIC DIAGRAM — AUDIO SECTION —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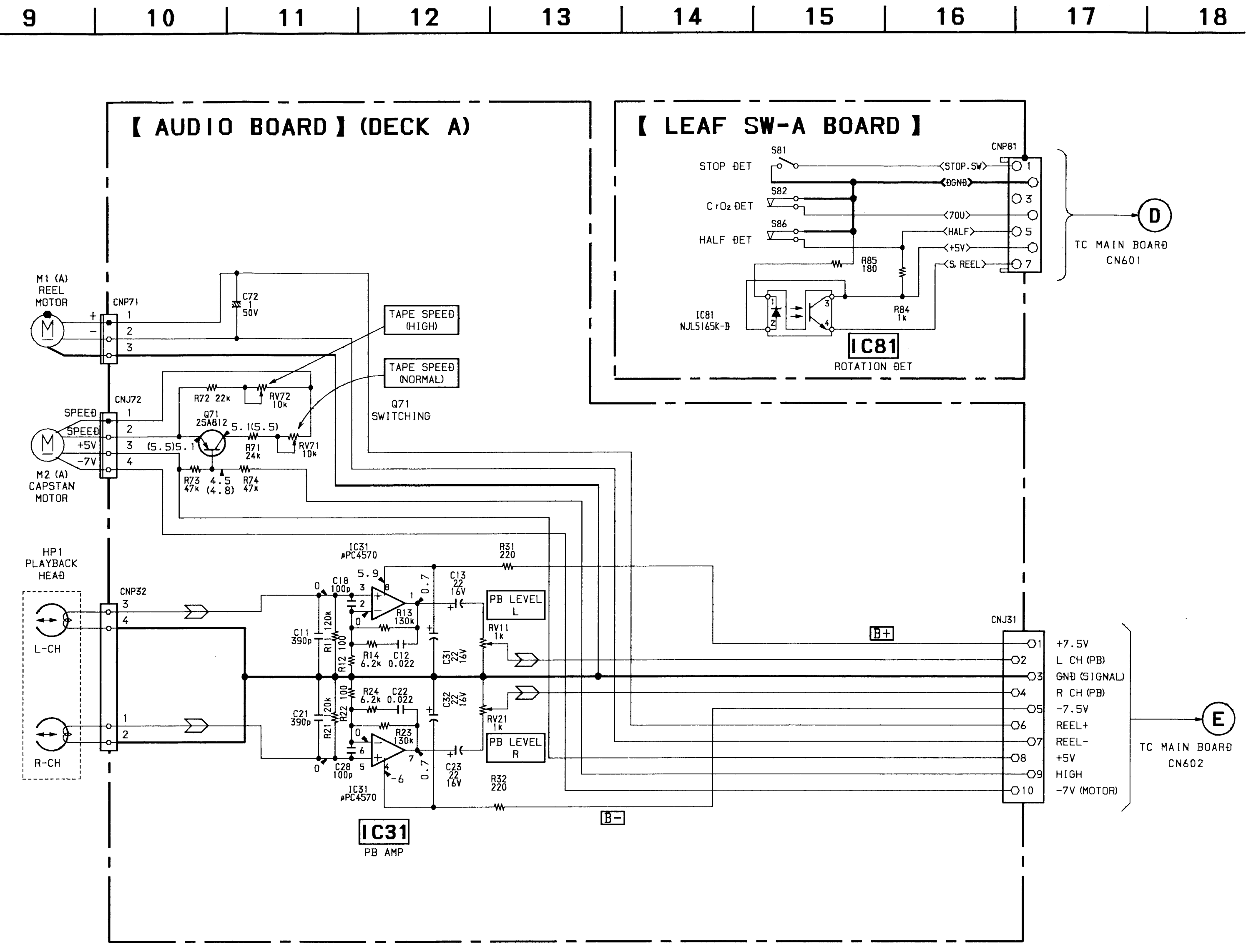
B
C
D
E
F
G
H
I
J
【AUDIO BOARD】(DECK B)
【LEAF SW-B BOARD】
M1 (B) REEL MOTOR
M2 (B) CAPSTAN MOTOR
CNP71
CNJ72
Q71 SPEED CONTROL
TAPE SPEED (HIGH)
TAPE SPEED (NORMAL)
S81 STOP DET
S82 CrO2 DET
S83 METAL DET
S84 ERASE PROOF (SIDE A)
S85 ERASE PROOF (SIDE B)
S86 HALF DET
IC81 NJL5165K ROTATION DET
CNP81
STOP.SW
DGND
METAL
70U
HALF
+5V
S.REEL
TC MAIN BOARD CN603
A
CNJ31
+7.5V
L CH (PB)
GND
R CH (PB)
-7.5V
REEL+
REEL-
+5V
HIGH
-7.5V (MOTOR)
TC MAIN BOARD CN604
B
HRPE1 RECORD/PLAYBACK/ERASE HEAD
L-CH
R-CH
ERASE
CNP32 (SJ7P)
IC32 REC/PB AMP
IC32 μPC4570
PB LEVEL L
PB LEVEL R
IC31 μPC1330
IC31 FUNCTION
CNJ33
BIAS
L-CH (REC)
GND
R-CH (REC)
RELAY
NC
TYPE
TC MAIN BOARD CN605
C
Q51, 52 BIAS OSC
Q53 BIAS ON/OFF
T51
RV12 REC BIAS L-CH
RV22 REC BIAS R-CH
118


10
11
12
13
14
15
16
17
18
【AUDIO BOARD】(DECK A)
【LEAF SW-A BOARD】
M1 (A) REEL MOTOR
M2 (A) CAPSTAN MOTOR
CNP71
CNJ72
Q71 SWITCHING
TAPE SPEED (HIGH)
TAPE SPEED (NORMAL)
HP1 PLAYBACK HEAD
L-CH
R-CH
CNP32
IC31 μPC4570
IC31 PB AMP
PB LEVEL L
PB LEVEL R
STOP DET
CrO2 DET
HALF DET
IC81 NJL5165K-B
IC81 ROTATION DET
CNP81
TC MAIN BOARD CN601
D
CNJ31
+7.5V
L CH (PB)
GND (SIGNAL)
R CH (PB)
-7.5V
REEL+
REEL-
+5V
HIGH
-7V (MOTOR)
TC MAIN BOARD CN602
E

**NOTE**

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- B+ :B+ Line.
- B- :B- Line.
- ▭ :adjustment for repair.

- Voltages are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  (　): REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⪢ :PB (DECK A)
  ▷ :PB (DECK B)
  ▷» :REC (DECK B)

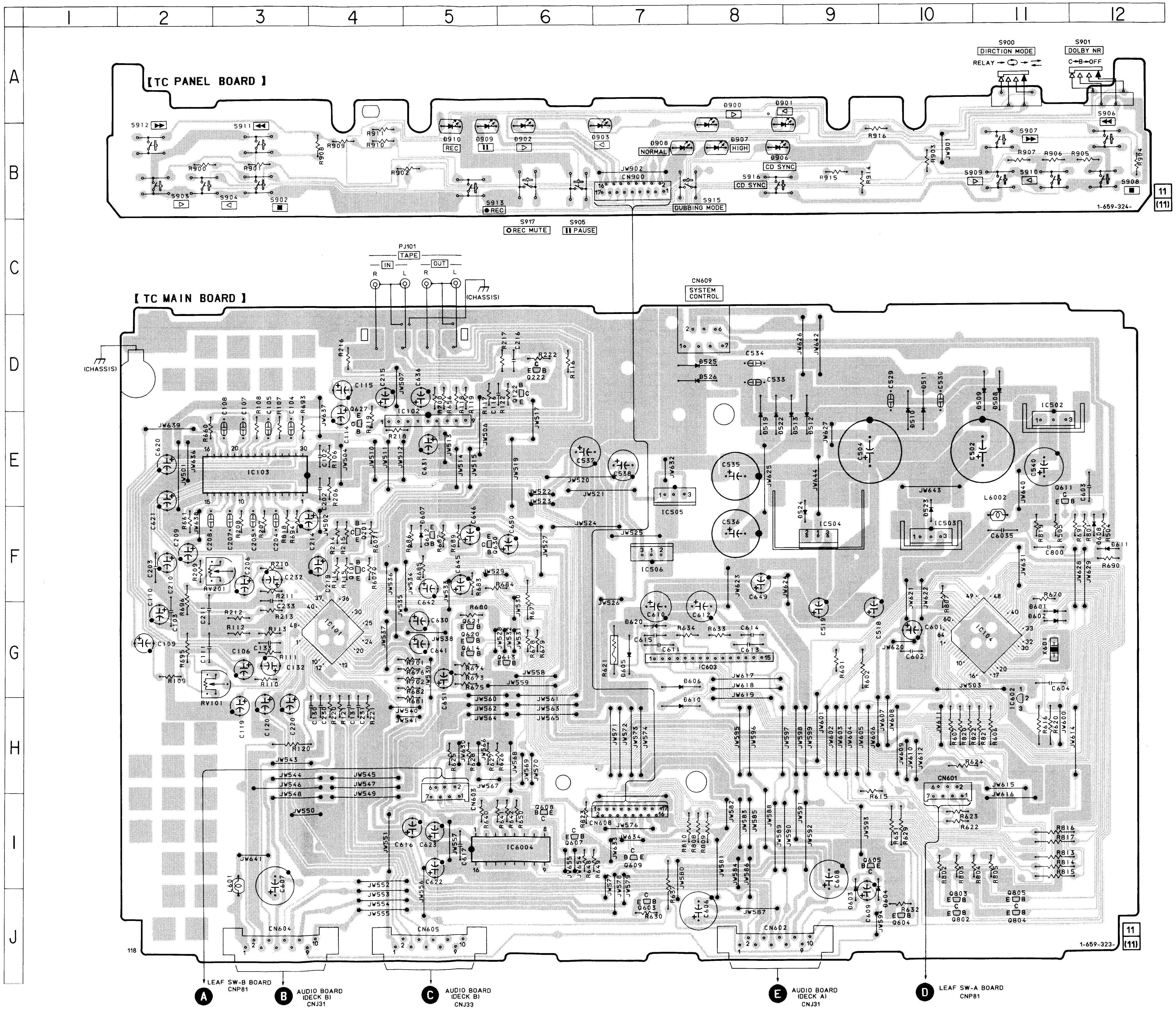
MC-Service

## 5-5. PRINTED WIRING BOARD — TC SECTION —

- **See page 12 for Circuit Boards Location.**

- **Semiconductor Location**

| Ref. No. | Location | Ref. No. | Location |
|---|---|---|---|
| D508 | D-11 | IC102 | E-5 |
| D509 | D-11 | IC103 | E-3 |
| D510 | E-10 | IC104 | G-11 |
| D511 | E-10 | IC502 | E-11 |
| D512 | E-9 | IC503 | F-10 |
| D513 | E-9 | IC504 | F-9 |
| D519 | E-8 | IC505 | E-7 |
| D522 | E-8 | IC506 | F-7 |
| D523 | F-10 | IC602 | H-11 |
| D524 | F-9 | IC603 | G-8 |
| D525 | D-8 | IC6004 | I-6 |
| D526 | D-8 | | |
| D601 | G-11 | Q101 | F-4 |
| D602 | G-11 | Q122 | D-6 |
| D603 | J-9 | Q201 | F-4 |
| D604 | J-9 | Q222 | D-6 |
| D605 | G-7 | Q603 | J-7 |
| D606 | G-7 | Q604 | J-10 |
| D607 | F-5 | Q605 | I-9 |
| D608 | F-12 | Q607 | I-6 |
| D610 | H-7 | Q608 | I-6 |
| D611 | F-12 | Q609 | I-7 |
| D620 | G-7 | Q611 | F-11 |
| D900 | B-8 | Q612 | F-5 |
| D901 | B-8 | Q613 | G-6 |
| D902 | B-6 | Q614 | G-5 |
| D903 | B-7 | Q620 | G-5 |
| D906 | B-8 | Q621 | G-5 |
| D907 | B-8 | Q627 | E-4 |
| D908 | B-7 | Q630 | F-5 |
| D909 | B-5 | Q802 | J-10 |
| D910 | B-5 | Q803 | J-10 |
| | | Q804 | J-11 |
| IC101 | G-4 | Q805 | J-11 |

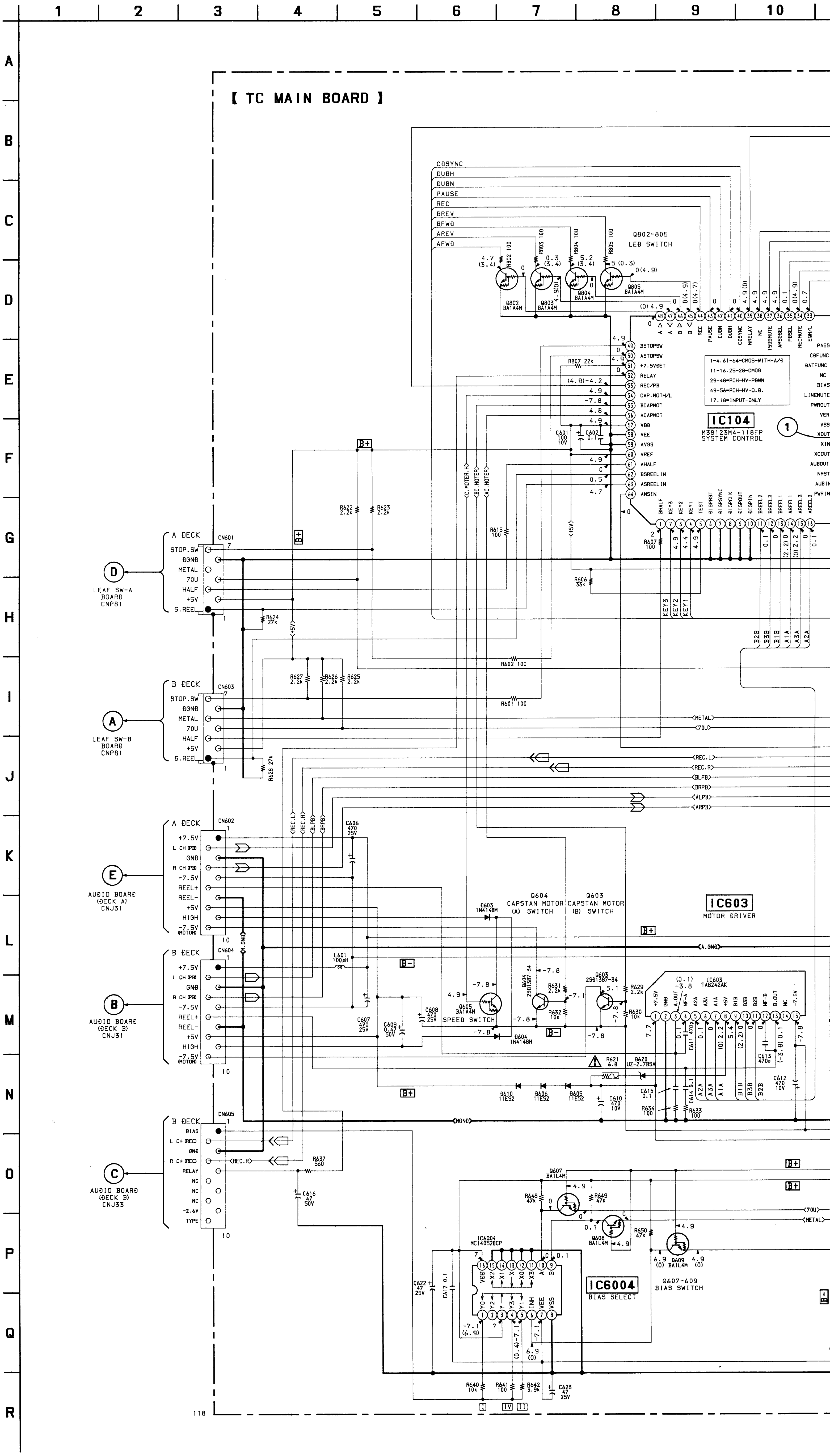

1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
[TC PANEL BOARD]
[TC MAIN BOARD]
S900
DIRCTION MODE
RELAY
S901
DOLBY NR
C B OFF
S912
S911
S903
S904
S902
S913
●REC
S917
○REC MUTE
S905
II PAUSE
S915
DUBBING MODE
S916
CD SYNC
S906
S907
S908
S909
S910
D900
D901
D902
D903
D906
D907
HIGH
D908
NORMAL
D909
D910
REC
CD SYNC
JW902
CN900
1-659-324-
11
(11)
PJ101
TAPE
IN
OUT
R
L
(CHASSIS)
CN609
SYSTEM CONTROL
IC101
IC102
IC103
IC104
IC502
IC503
IC504
IC505
IC506
IC602
IC603
IC6004
RV101
RV201
L6002
X601
CN601
CN603
CN604
CN605
CN602
CN608
1-659-323-
11
(11)
118
A LEAF SW-B BOARD CNP81
B AUDIO BOARD (DECK B) CNJ31
C AUDIO BOARD (DECK B) CNJ33
E AUDIO BOARD (DECK A) CNJ31
D LEAF SW-A BOARD CNP81

**Note:**

- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.

## 5-6. SCHEMATIC DIAGRAM — TC SECTION —

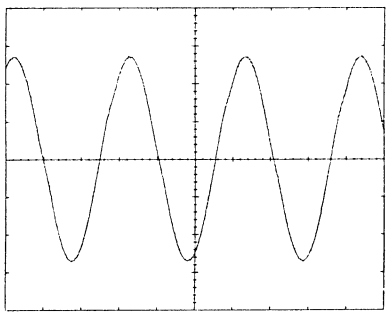
- **See page 10 for IC Pin function. (IC104)**
- **See page 23 for IC Block Diagrams.**



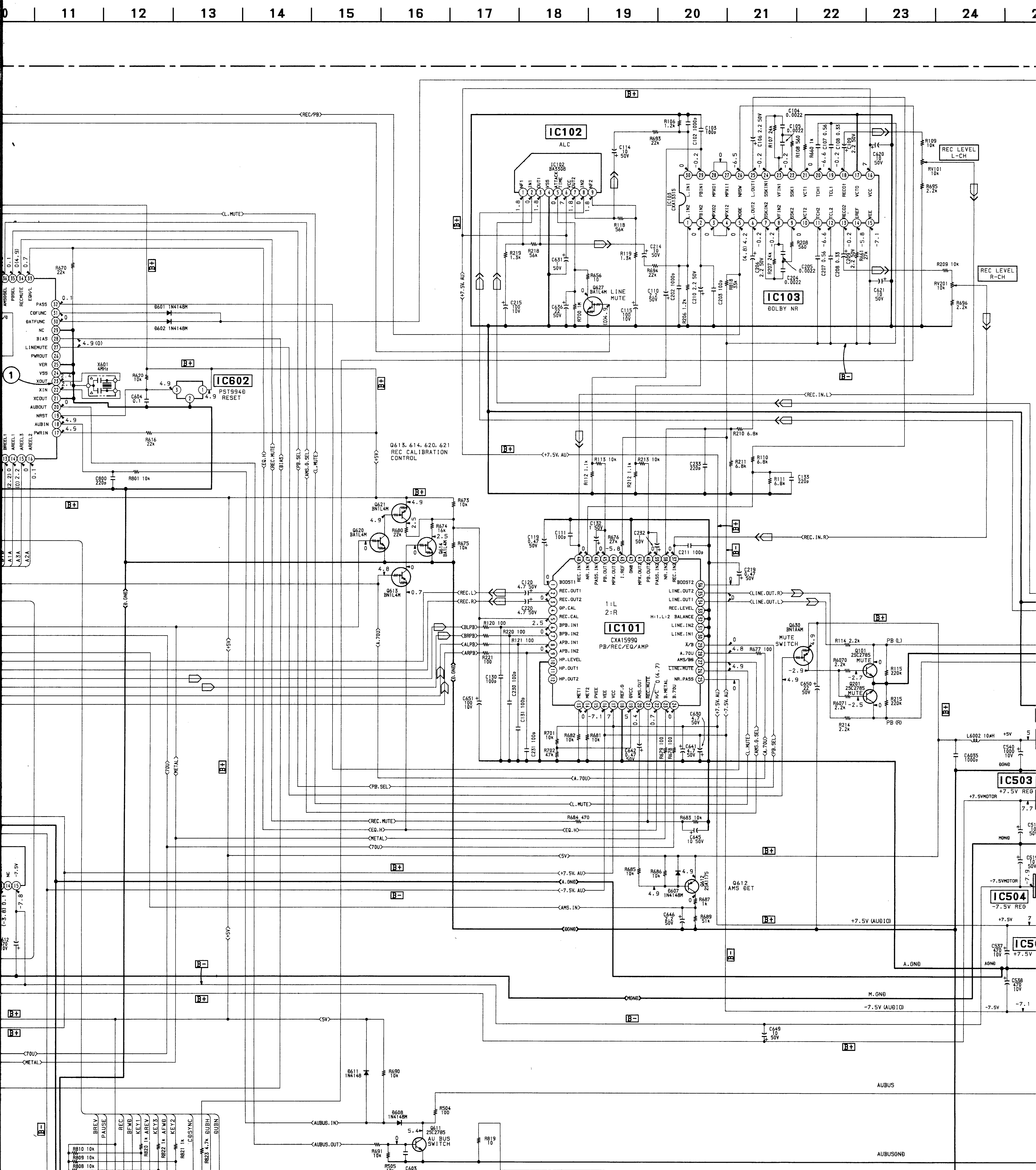
1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
【 TC MAIN BOARD 】
Q802-805
LED SWITCH
IC104
M38123M4-118FP
SYSTEM CONTROL
1-4.61-64=CMOS-WITH-A/D
11-16.25-28=CMOS
29-48=PCH-HV-PDWN
49-56=PCH-HV-O.D.
17.18=INPUT-ONLY
LEAF SW-A BOARD CNP81
LEAF SW-B BOARD CNP81
AUDIO BOARD (DECK A) CNJ31
AUDIO BOARD (DECK B) CNJ31
AUDIO BOARD (DECK B) CNJ33
A DECK
B DECK
CN601
CN603
CN602
CN604
CN605
Q604 CAPSTAN MOTOR (A) SWITCH
Q603 CAPSTAN MOTOR (B) SWITCH
Q605 SPEED SWITCH
IC603
MOTOR DRIVER
IC603 TA8242AK
IC6004
MC14052BCP
IC6004
BIAS SELECT
Q607-609
BIAS SWITCH

• **Waveform**

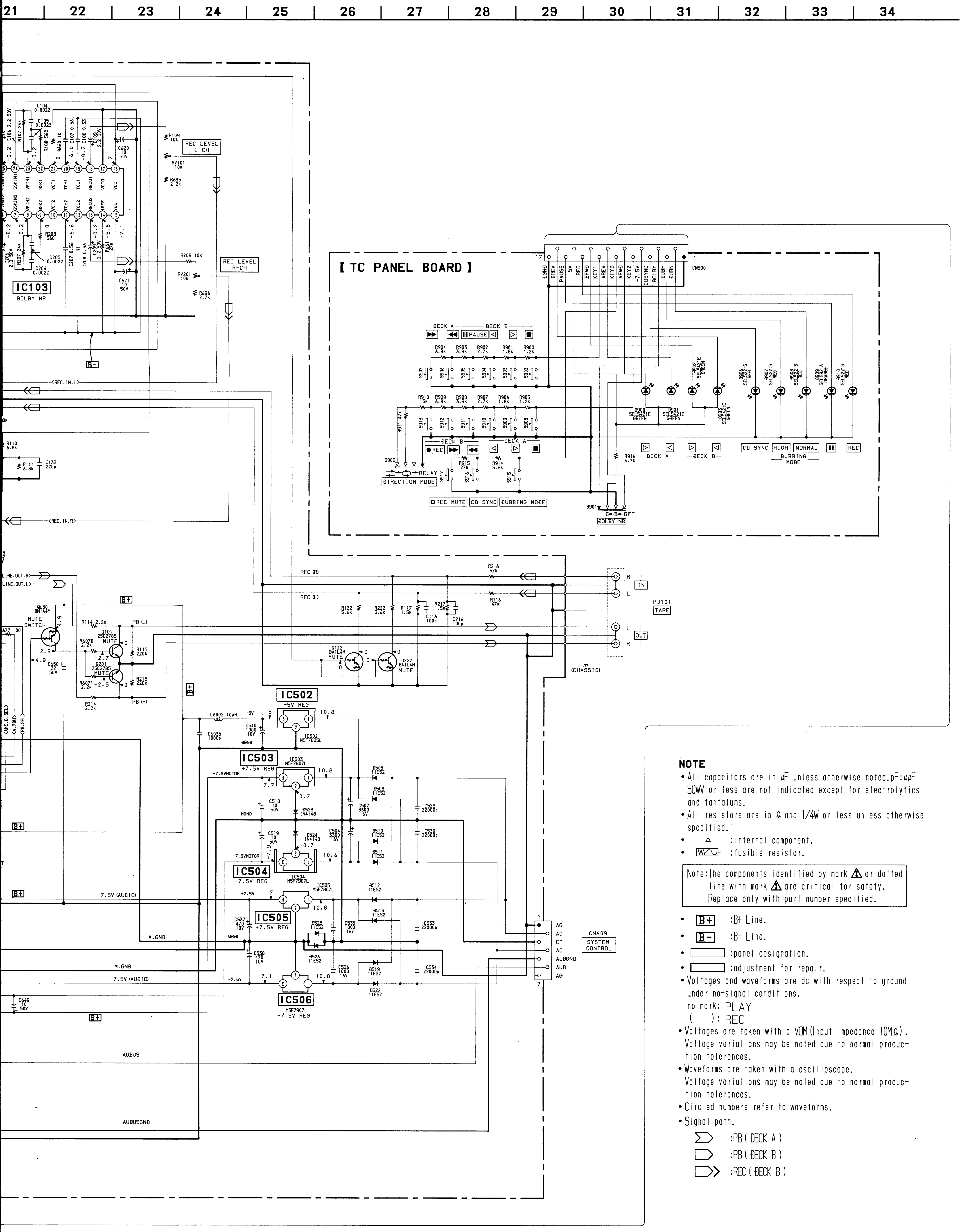
① IC104 ㉓ 4.5 Vp-p 4MHz



MC-Service



11
12
13
14
15
16
17
18
19
20
21
22
23
24
IC102
ALC
IC102 BA3308
IC103
DOLBY NR
IC103 CXA1331S
IC101
CXA1599Q
PB/REC/EQ/AMP
1:L
2:R
IC602
PST9940
RESET
X601 4MHz
Q613, 614, 620, 621
REC CALIBRATION
CONTROL
Q627 BA1L4M
LINE MUTE
Q630 BN1A4M
MUTE SWITCH
Q101 2SC2785 MUTE
Q201 2SC2785 MUTE
Q612 2SA1175
AMS DET
Q611 2SC2785
AU BUS SWITCH
REC LEVEL L-CH
REC LEVEL R-CH
RV101 10k
RV201 10k
IC503
+7.5V REG
IC504
-7.5V REG
CN608
<REC/PB>
<L.MUTE>
<REC.IN.L>
<REC.IN.R>
<LINE.OUT.R>
<LINE.OUT.L>
<REC.L>
<REC.R>
<BLPB>
<BRPB>
<ALPB>
<ARPB>
<A.70U>
<PB.SEL>
<REC.MUTE>
<EQ.H>
<METAL>
<70U>
<5V>
<+7.5V.AU>
<A.GND>
<-7.5V.AU>
<AMS.IN>
<BGND>
<MGND>
<AUBUS.IN>
<AUBUS.OUT>
AUBUS
AUBUSGND
A.GND
M.GND
-7.5V (AUDIO)
+7.5V (AUDIO)
PB (L)
PB (R)
L6002 10μH
BREV
PAUSE
REC
BFWD
KEY1
AREV
AFWD
KEY2
CDSYNC
DUBH
DUBN


21
22
23
24
25
26
27
28
29
30
31
32
33
34
IC103
DOLBY NR
REC LEVEL L-CH
REC LEVEL R-CH
RV101 10k
RV201 10k
R109 10k
R209 10k
R695 2.2k
R696 2.2k
C620 10 50V
C621 10 50V
C104 0.0022
C105 0.0022
C204 0.0022
C205 0.0022
R208 560
R108 560
SSKIN1
VFIN1
SSK1
VCT1
TCH1
TCL1
RECO1
VCTO
VCC
SSKIN2
VFIN2
SSK2
VCT2
TCH2
TCL2
RECO2
VREF
VEE
B-
B+
<REC.IN.L>
<REC.IN.R>
R110 6.8k
R111 6.8k
C133 220p
LINE.OUT.R
LINE.OUT.L
Q630 BN1A4M
MUTE SWITCH
R114 2.2k
PB (L)
PB (R)
Q101 2SC2785 MUTE
Q201 2SC2785 MUTE
R6070 2.2k
R6071 2.2k
R115 220k
R215 220k
R214 2.2k
C650 22 50V
<MS.G.SEL>
<A.7DU>
<PB.SEL>
【 TC PANEL BOARD 】
CN900
17
1
DGND
BREV
PAUSE
5V
REC
BFWD
KEY1
AREV
KEY3
AFWD
KEY2
-7.5V
CDSYNC
DOLBY
DUBH
DUBN
DECK A
DECK B
PAUSE
R904 6.8k
R903 3.9k
R902 2.7k
R901 1.8k
R900 1.2k
S907
S906
S905
S904
S903
S902
R910 15k
R909 6.8k
R908 3.9k
R907 2.7k
R906 1.8k
R905 1.2k
S913
S912
S911
S910
S909
S908
R911 47k
REC
S900
RELAY
DIRECTION MODE
R915 27k
R914 5.6k
S917
S916
S915
○REC MUTE
CD SYNC
DUBBING MODE
D900 SEL5421E GREEN
D901 SEL5421E GREEN
D902 SEL5421E GREEN
D903 SEL5421E GREEN
D906 SEL5221S RED
D907 SEL5221S RED
D908 SEL5221S RED
D909 SEL5921A ORANGE
D910 SEL5221S RED
R916 4.7k
S901
C B OFF
DOLBY NR
CD SYNC
HIGH
NORMAL
DUBBING MODE
REC (R)
REC (L)
R216 47k
R116 47k
R122 5.6k
R222 5.6k
R117 1.5k
R217 1.5k
C116 100p
C216 100p
Q122 BA1L4M MUTE
Q222 BA1L4M MUTE
IN
OUT
R
L
PJ101 TAPE
(CHASSIS)
IC502
+5V REG
IC502 M5F7805L
L6002 10μH
+5V
C6035 1000p
C540 1000 10V
DGND
IC503
+7.5V REG
IC503 M5F7807L
+7.5VMOTOR
C518 10 50V
D523 1N4148
MGND
C519 10 50V
D524 1N4148
C504 3300 16V
C502 3300 16V
-7.5VMOTOR
IC504
-7.5V REG
IC504 M5F7907L
IC505 M5F7807L
+7.5V
IC505
+7.5V REG
C537 470 10V
C538 470 10V
AGND
D525 11ES2
D526 11ES2
C535 1000 16V
C536 1000 16V
-7.5V
IC506
M5F7907L
-7.5V REG
D508 11ES2
D509 11ES2
D510 11ES2
D511 11ES2
D512 11ES2
D513 11ES2
D519 11ES2
D522 11ES2
C529 22000p
C530 22000p
C533 22000p
C534 22000p
CN609
SYSTEM CONTROL
AG
AC
CT
AC
AUBGND
AUB
AG
+7.5V (AUDIO)
A.GND
M.GND
-7.5V (AUDIO)
C649 10 50V
AUBUS
AUBUSGND

**NOTE**

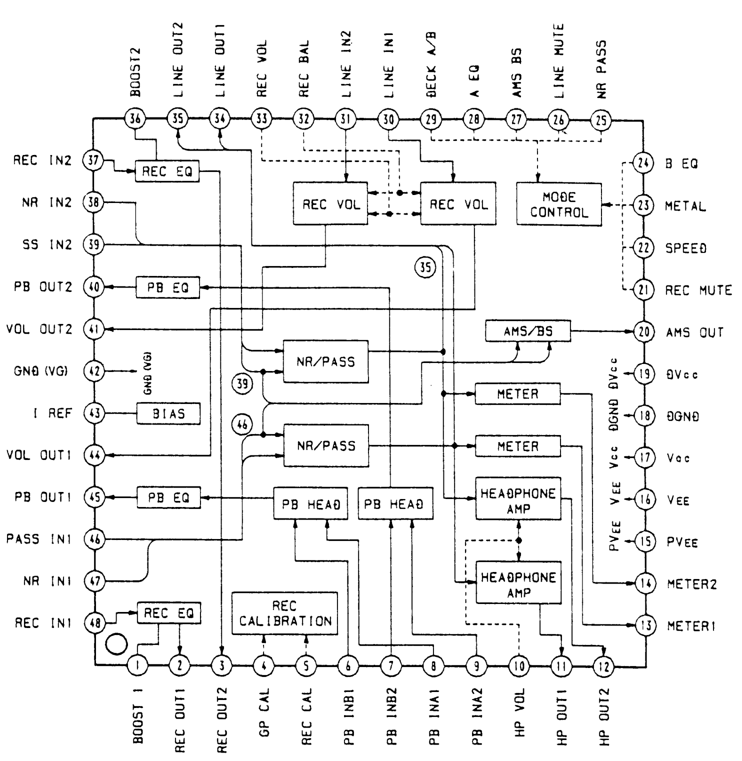
- All capacitors are in μF unless otherwise noted.pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- —WW∿— :fusible resistor.

Note:The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

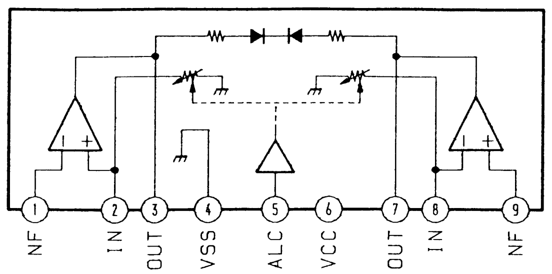
- B+ :B+ Line.
- B- :B- Line.
- ▭ :panel designation.
- ▭ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  ( ): REC
- Voltages are taken with a VOM(Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⊳ :PB(DECK A)
  ▷ :PB(DECK B)
  ▷> :REC(DECK B)

## 5-7. IC BLOCK DIAGRAMS

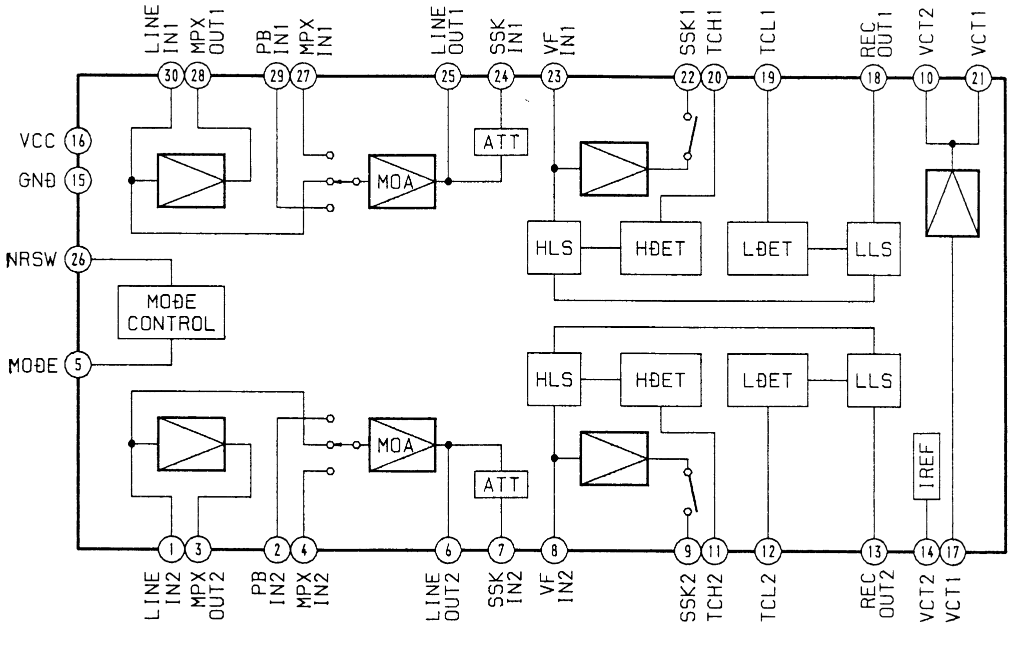
### IC101 CXA1599Q


BOOST2
LINE OUT2
LINE OUT1
REC VOL
REC BAL
LINE IN2
LINE IN1
DECK A/B
A EQ
AMS BS
LINE MUTE
NR PASS
36
35
34
33
32
31
30
29
28
27
26
25
REC IN2
NR IN2
SS IN2
PB OUT2
VOL OUT2
GND (VG)
I REF
VOL OUT1
PB OUT1
PASS IN1
NR IN1
REC IN1
37
38
39
40
41
42
43
44
45
46
47
48
B EQ
METAL
SPEED
REC MUTE
AMS OUT
DVcc
DGND
Vcc
VEE
PVEE
METER2
METER1
24
23
22
21
20
19
18
17
16
15
14
13
REC EQ
REC VOL
REC VOL
MODE CONTROL
PB EQ
35
AMS/BS
NR/PASS
GND (VG)
39
METER
BIAS
46
NR/PASS
METER
PB EQ
PB HEAD
PB HEAD
HEADPHONE AMP
HEADPHONE AMP
REC EQ
REC CALIBRATION
DVcc
DGND
Vcc
VEE
PVEE
1
2
3
4
5
6
7
8
9
10
11
12
BOOST 1
REC OUT1
REC OUT2
GP CAL
REC CAL
PB INB1
PB INB2
PB INA1
PB INA2
HP VOL
HP OUT1
HP OUT2

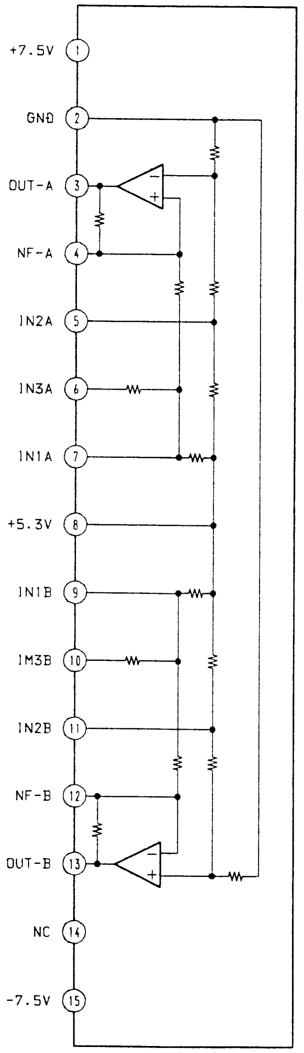
### IC102 BA3308


1
2
3
4
5
6
7
8
9
NF
IN
OUT
VSS
ALC
VCC
OUT
IN
NF

### IC103 CXA1331S


LINE IN1
MPX OUT1
PB IN1
MPX IN1
LINE OUT1
SSK IN1
VF IN1
SSK1
TCH1
TCL1
REC OUT1
VCT2
VCT1
30
28
29
27
25
24
23
22
20
19
18
10
21
VCC
16
GND
15
NRSW
26
MODE CONTROL
MODE
5
ATT
MOA
HLS
HDET
LDET
LLS
HLS
HDET
LDET
LLS
MOA
ATT
IREF
1
3
2
4
6
7
8
9
11
12
13
14
17
LINE IN2
MPX OUT2
PB IN2
MPX IN2
LINE OUT2
SSK IN2
VF IN2
SSK2
TCH2
TCL2
REC OUT2
VCT2
VCT1

### IC603 TA8242AK


+7.5V
1
GND
2
OUT-A
3
NF-A
4
IN2A
5
IN3A
6
IN1A
7
+5.3V
8
IN1B
9
IM3B
10
IN2B
11
NF-B
12
OUT-B
13
NC
14
-7.5V
15

# SECTION 6

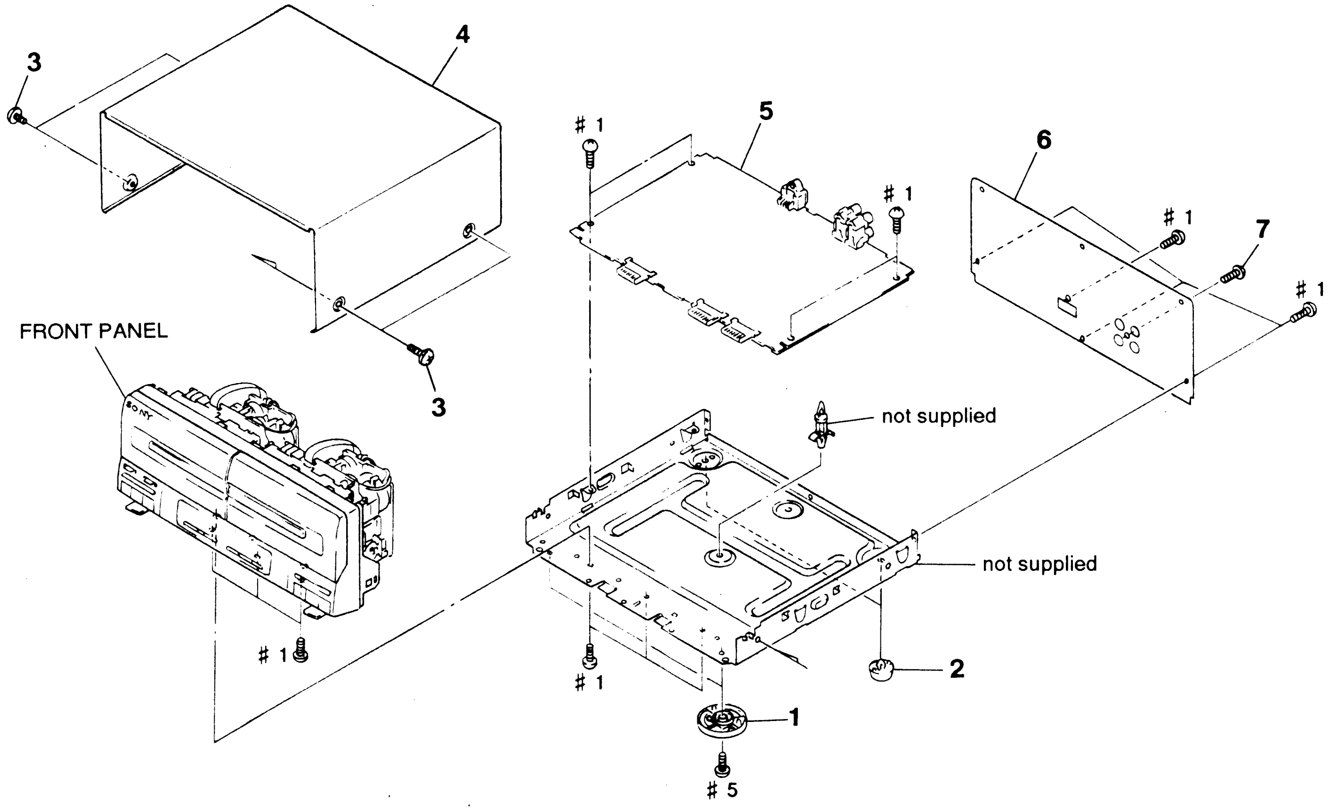
# EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  EA : Saudi Arabia model
  TH : Thailand model

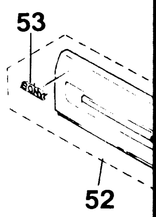
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

## 6-1. CHASSIS SECTION


3
4
#1
5
6
#1
#1
7
#1
FRONT PANEL
3
not supplied
not supplied
#1
2
#1
1
#5

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | 4-977-699-11 | LEG (F) | |
| 2 | 4-965-822-01 | FOOT | |
| 3 | 3-363-099-01 | SCREW (CASE 3 TP2) | |
| ∗ 4 | 4-978-245-51 | CASE (SILVER) | |
| ∗ 4 | 4-978-245-71 | CASE (BLACK) | |
| ∗ 5 | A-2007-477-A | TC MAIN BOARD, COMPLETE | |
| ∗ 6 | 4-978-260-01 | PANEL, BACK (EX100:AEP, UK) | |
| ∗ 6 | 4-978-260-11 | PANEL, BACK (EX100:E) | |
| ∗ 6 | 4-978-260-21 | PANEL, BACK (EX100:EA) | |
| ∗ 6 | 4-978-260-31 | PANEL, BACK (EX100:TH) | |
| ∗ 6 | 4-978-260-41 | PANEL, BACK (EX90:AEP, UK) | |
| ∗ 6 | 4-978-260-51 | PANEL, BACK (EX90:E) | |
| ∗ 6 | 4-978-260-61 | PANEL, BACK (EX90:EA) | |
| ∗ 6 | 4-978-260-71 | PANEL, BACK (EX90:TH) | |
| 7 | 3-704-515-01 | SCREW (BV/RING) | |

## 6-2. FRO



| Ref. No. | Par |
|---|---|
| 51 | X-3 |
| 51 | X-4 |
| 52 | X-3 |
| 52 | X-4 |
| 53 | 4-9 |
| 54 | X-4 |
| 55 | 4-9 |
| 56 | X-3 |
| 56 | X-4 |
| 57 | 4-9 |
| 57 | 4-9 |
| 58 | 1-7 |
| 59 | 4-9 |
| 59 | 4-9 |
| 60 | 4-9 |
| 60 | 4-9 |

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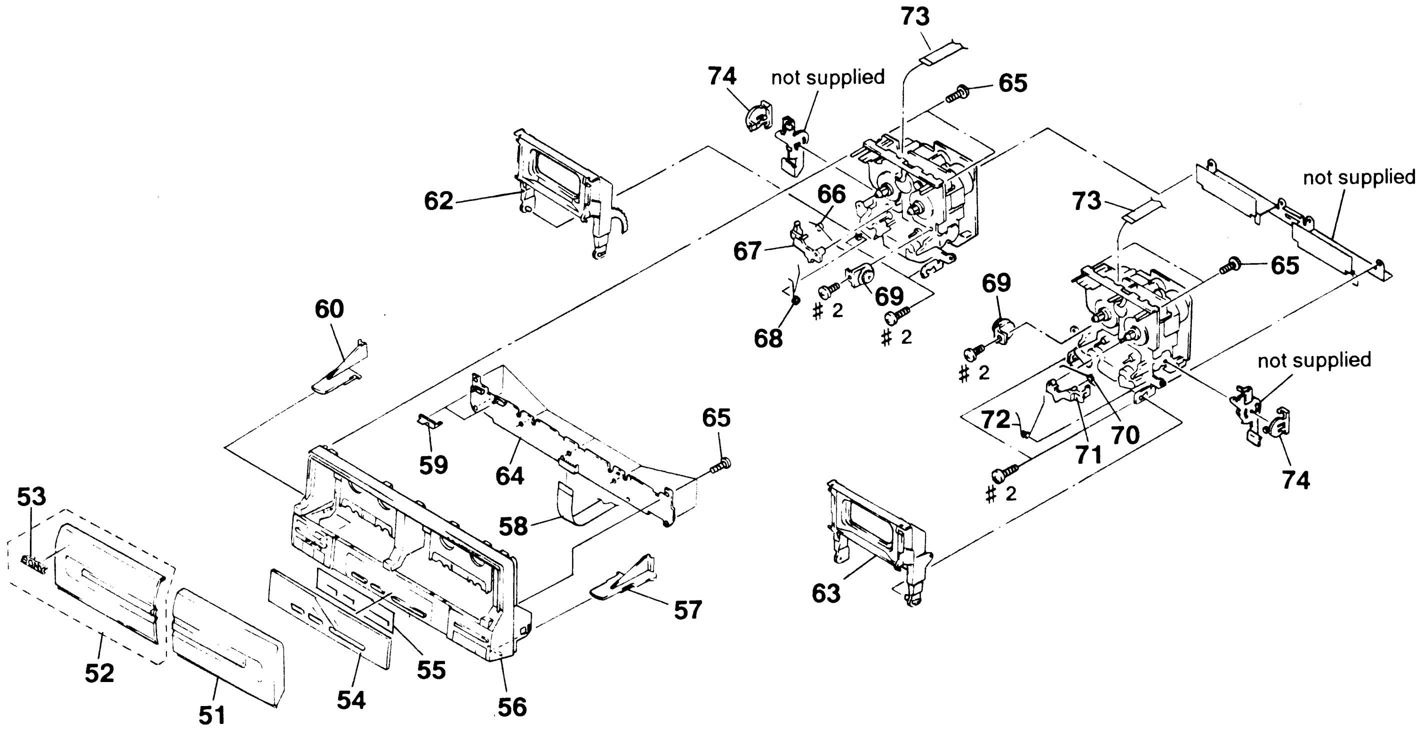
mark
⚠ are
umber

Remark

# 1

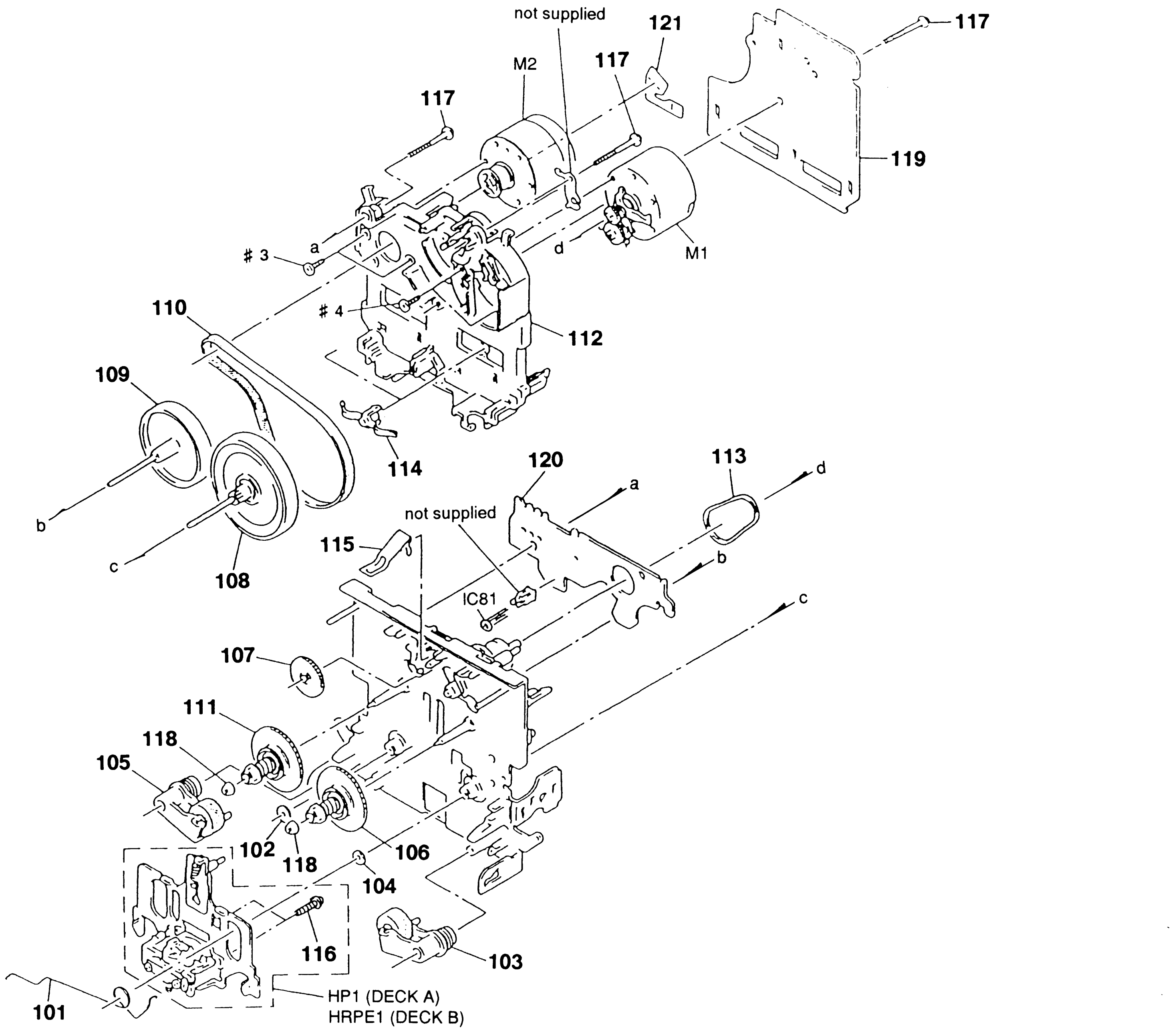
## 6-2. FRONT PANEL SECTION


73
74
not supplied
65
62
66
67
69
68
# 2
# 2
73
not supplied
65
69
# 2
60
not supplied
72
71
70
# 2
74
65
53
59
64
58
57
63
52
51
54
55
56

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 51 | X-3371-674-1 | LID (B) ASSY, CASSETTE (BLACK) | |
| 51 | X-4946-613-1 | LID (B) ASSY, CASSETTE (SILVER) | |
| 52 | X-3371-673-1 | LID (A) ASSY, CASSETTE (BLACK) | |
| 52 | X-4946-612-1 | LID (A) ASSY, CASSETTE (SILVER) | |
| 53 | 4-962-708-11 | EMBLEM (4-A), SONY | |
| 54 | X-4947-183-1 | WINDOW ASSY | |
| 55 | 4-978-257-01 | ILLUMINATOR | |
| 56 | X-3371-672-1 | PANEL ASSY, FRONT (BLACK) | |
| 56 | X-4946-611-1 | PANEL ASSY, FRONT (SILVER) | |
| 57 | 4-978-255-01 | LEVER (EJECT-B) (SILVER) | |
| 57 | 4-978-255-11 | LEVER (EJECT-B) (BLACK) | |
| 58 | 1-769-390-11 | WIRE (FLAT TYPE) (17 CORE) | |
| 59 | 4-978-256-01 | KNOB (SLIDE) (SILVER) | |
| 59 | 4-978-256-11 | KNOB (SLIDE) (BLACK) | |
| 60 | 4-978-254-01 | LEVER (EJECT-A) (SILVER) | |
| 60 | 4-978-254-11 | LEVER (EJECT-A) (BLACK) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 62 | X-3371-697-1 | HOLDER (L) ASSY, CASSETTE (TH) | |
| 62 | X-3372-081-1 | HOLDER (L) ASSY, CASSETTE (AEP, UK, E, EA) | |
| 63 | X-3371-698-1 | HOLDER (R) ASSY, CASSETTE (TH) | |
| 63 | X-3372-082-1 | HOLDER (R) ASSY, CASSETTE (AEP, UK, E, EA) | |
| * 64 | A-2007-478-A | TC PANEL BOARD, COMPLETE | |
| 65 | 4-951-620-01 | SCREW (2.6X8), +BVTP | |
| 66 | 3-354-961-01 | SPRING (EJ SAFTY SPRING L) | |
| 67 | 3-354-955-01 | LEVER (EJ SAFTY LEVER L) | |
| 68 | 4-959-231-11 | SPRING (L), TORSION | |
| 69 | 3-354-963-01 | DAMPER | |
| 70 | 3-354-962-01 | SPRING (EJ SAFTY SPRING R) | |
| 71 | 3-354-956-01 | LEVER (EJ SAFTY LEVER R) | |
| 72 | 4-959-232-11 | SPRING (R), TORSION | |
| 73 | 1-765-384-11 | WIRE (FLAT TYPE) (7 CORE) | |
| 74 | 3-354-957-01 | JOINT (LOCK LEVER) | |

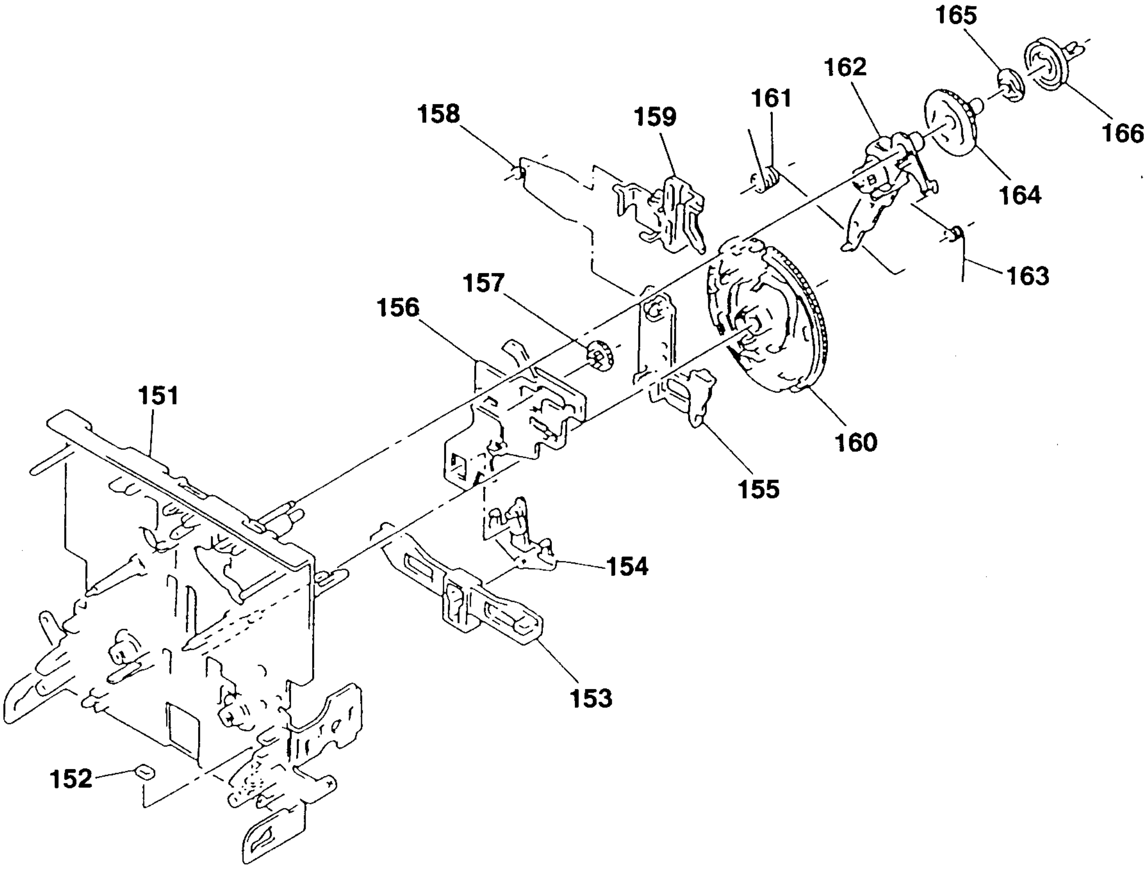
## 6-3. MECHANISM SECTION-1
## (DECK A: TCM-190RA12CL)
## (DECK B: TCM-190RB52C)


not supplied
121
117
M2
117
117
119
# 3
a
d
M1
# 4
110
112
109
114
120
113
d
a
b
b
c
not supplied
115
108
IC81
c
107
111
118
105
102
118
106
104
116
103
101
HP1 (DECK A)
HRPE1 (DECK B)

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 101 | 3-907-362-01 | SPRING, TORSION | |
| 102 | 3-356-714-01 | WASHER | |
| 103 | X-3366-047-1 | LEVER (PINCH F) ASSY | |
| 104 | 3-356-713-01 | WASHER | |
| 105 | X-3366-048-1 | LEVER (PINCH R) ASSY | |
| 106 | X-3366-971-1 | TABLE ASSY (B), REEL (DECK A) | |
| 106 | X-3369-508-1 | TABLE (C) ASSY, REEL (DECK B) | |
| 107 | 3-359-424-01 | GEAR (REV GEAR) | |
| 108 | X-3367-629-1 | FLYWHEEL (FWD) ASSY | |
| 109 | X-3359-410-1 | FLYWHEEL (REV) ASSY (DECK A) | |
| 109 | X-3367-630-1 | FLYWHEEL (REV) ASSY (DECK B) | |
| 110 | 3-359-417-01 | BELT (FLAT), CAPSTAN | |
| 111 | X-3366-970-1 | TABLE ASSY, REEL | |
| 112 | 3-359-436-11 | BASE (THRUST RETAINER), FITTING | |
| 113 | 3-359-466-01 | BELT (FR), SQUARE | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 114 | 3-575-321-00 | RETAINER, THRUST, CAPSTAN | |
| 115 | 3-359-430-01 | SPRING (CASSETTE RETAINER), LEAF | |
| 116 | 3-388-848-01 | SCREW (P2X6) (B TIGHT) | |
| 117 | 3-359-414-01 | SCREW (+PTPWH 2X23) | |
| 118 | 3-362-308-01 | CAP (REEL) | |
| * 119 | A-2007-266-A | AUDIO BOARD, COMPLETE (DECK A) | |
| * 119 | A-2007-133-A | AUDIO BOARD, COMPLETE (DECK B) | |
| * 120 | 1-638-020-11 | LEAF SW-A BOARD | |
| * 120 | 1-638-020-11 | LEAF SW-B BOARD | |
| 121 | 1-638-983-11 | MOTOR FLEXIBLE BOARD | |
| HP1 | A-2003-757-A | BASE ASSY, HEAD (PB) (DECK A) | |
| HRPE1 | A-2003-930-A | BASE ASSY, HEAD (PB/REC/ERASE) (DECK A) | |
| IC81 | 8-749-924-10 | IC PHONT REFLECTOR NJL5165K-B(HI) | |
| M1 | X-3363-501-2 | MOTOR ASSY (REEL) | |
| M2 | X-3365-377-2 | MOTOR ASSY (CAPSTAN) | |

## 6-4. MECHANISM SECTION-2
## (DECK A: TCM-190RA12CL
## DECK B: TCM-190RB52C)



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 151 | X-3359-415-1 | CHASSIS ASSY, MECHANICAL | |
| 152 | 3-359-469-01 | SPACER | |
| 153 | 3-359-425-01 | SLIDER (REVERSE SLIDER) | |
| 154 | 3-359-426-01 | LEVER (REVERSE LEVER) | |
| 155 | 3-359-427-01 | SLIDER (LEVERSE SLIDER) | |
| * 156 | 3-359-415-01 | SLIDER (TRIGGER SLIDER)(DECK A) | |
| 156 | 3-359-415-11 | SLIDER (TRIGGER SLIDER)(DECK B) | |
| 157 | 3-359-448-01 | GEAR (TRIGGER) | |
| 158 | 3-359-454-01 | SPRING, TORSION | |
| 159 | 3-359-429-01 | SLIDER (BRAKE PLATE)(DECK A) | |
| 159 | 3-359-429-11 | SLIDER (BRAKE PLATE)(DECK B) | |
| 160 | 3-359-420-01 | GEAR (CAM GEAR) | |
| 161 | 3-359-456-01 | SPRING(TRIGGER SPRING), TORSION | |
| 162 | X-3366-569-1 | ARM ASSY, FR | |
| 163 | 3-924-185-11 | SPRING (FR ARM), TORSION | |
| 164 | 3-359-419-11 | GEAR (FR GEAR) | |
| 165 | 3-359-421-01 | CLUTCH (REEL DISK) | |
| 166 | 3-359-418-01 | PULLEY (FR PULLEY) | |

# SECTION 7
# ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | A-2007-266-A | AUDIO BOARD, COMPLETE (DECK A) | |
| | | ****************************** | |
| | | < CAPACITOR > | |
| C11 | 1-163-131-00 | CERAMIC CHIP 390PF 5% | 50V |
| C12 | 1-136-157-00 | FILM 0.022uF 5% | 50V |
| C13 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C18 | 1-163-251-11 | CERAMIC CHIP 100PF 5% | 50V |
| C21 | 1-163-131-00 | CERAMIC CHIP 390PF 5% | 50V |
| C22 | 1-136-157-00 | FILM 0.022uF 5% | 50V |
| C23 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C28 | 1-163-251-11 | CERAMIC CHIP 100PF 5% | 50V |
| C31 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C32 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C72 | 1-109-889-11 | ELECT 1uF 20% | 50V |
| | | < CONNECTOR > | |
| * CNJ31 | 1-580-782-11 | CONNECTOR, BOARD TO BOARD | |
| CNJ72 | 1-764-902-11 | CONNECTOR, FFC/FPC 4P | |
| * CNP32 | 1-580-772-11 | PIN, CONNECTOR (PC BOARD) 4P | |
| * CNP71 | 1-564-719-11 | PIN, CONNECTOR (SMALL TYPE) 3P | |
| | | < IC > | |
| IC31 | 8-759-106-02 | IC uPC4570G2 | |
| | | < JUMPER RESISTOR > | |
| JW1 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | |
| JW51 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW52 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW53 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW54 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| | | < TRANSISTOR > | |
| Q71 | 8-729-216-22 | TRANSISTOR 2SA1162-G | |
| | | < RESISTOR > | |
| R11 | 1-216-099-00 | METAL CHIP 120K 5% 1/10W | |
| R12 | 1-216-025-91 | METAL GLAZE 100 5% 1/10W | |
| R13 | 1-216-100-00 | METAL GLAZE 130K 5% 1/10W | |
| R14 | 1-216-068-00 | METAL CHIP 6.2K 5% 1/10W | |
| R21 | 1-216-099-00 | METAL CHIP 120K 5% 1/10W | |
| R22 | 1-216-025-91 | METAL GLAZE 100 5% 1/10W | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R23 | 1-216-100-00 | METAL GLAZE 130K 5% 1/10W | |
| R24 | 1-216-068-00 | METAL CHIP 6.2K 5% 1/10W | |
| R31 | 1-216-033-00 | METAL CHIP 220 5% 1/10W | |
| R32 | 1-216-033-00 | METAL CHIP 220 5% 1/10W | |
| R71 | 1-216-082-00 | METAL GLAZE 24K 5% 1/10W | |
| R72 | 1-216-081-00 | METAL CHIP 22K 5% 1/10W | |
| R73 | 1-216-089-91 | METAL GLAZE 47K 5% 1/10W | |
| R74 | 1-216-089-91 | METAL GLAZE 47K 5% 1/10W | |
| | | < VARIABLE RESISTOR > | |
| RV11 | 1-241-761-11 | RES, ADJ, CARBON 1K | |
| RV21 | 1-241-761-11 | RES, ADJ, CARBON 1K | |
| RV71 | 1-241-630-11 | RES, ADJ, CARBON 10K | |
| RV72 | 1-241-630-11 | RES, ADJ, CARBON 10K | |
| ************************************************************ | | | |
| * | A-2007-133-A | AUDIO BOARD, COMPLETE (DECK B) | |
| | | ****************************** | |
| | | < CAPACITOR > | |
| C11 | 1-163-131-00 | CERAMIC CHIP 390PF 5% | 50V |
| C12 | 1-163-251-11 | CERAMIC CHIP 100PF 5% | 50V |
| C13 | 1-136-153-00 | FILM 0.01uF 5% | 50V |
| C14 | 1-126-177-11 | ELECT 100uF 20% | 10V |
| C15 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C16 | 1-136-434-11 | FILM 120PF 5% | 630V |
| C17 | 1-102-113-00 | CERAMIC 390PF 10% | 50V |
| C18 | 1-163-237-11 | CERAMIC CHIP 27PF 5% | 50V |
| C21 | 1-163-131-00 | CERAMIC CHIP 390PF 5% | 50V |
| C22 | 1-163-251-11 | CERAMIC CHIP 100PF 5% | 50V |
| C23 | 1-136-153-00 | FILM 0.01uF 5% | 50V |
| C24 | 1-126-177-11 | ELECT 100uF 20% | 10V |
| C25 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C26 | 1-136-434-11 | FILM 120PF 5% | 630V |
| C27 | 1-102-113-00 | CERAMIC 390PF 10% | 50V |
| C28 | 1-163-237-11 | CERAMIC CHIP 27PF 5% | 50V |
| C31 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C32 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C33 | 1-124-234-00 | ELECT 22uF 20% | 16V |
| C51 | 1-164-182-11 | CERAMIC CHIP 0.0033uF 10% | 50V |
| C52 | 1-164-182-11 | CERAMIC CHIP 0.0033uF 10% | 50V |
| C53 | 1-163-019-00 | CERAMIC CHIP 0.0068uF 10% | 50V |
| C54 | 1-107-364-11 | FILM 0.012uF 5% | 100V |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| C56 | 1-164-505-11 | CERAMIC CHIP 2.2uF | 16V |
| C57 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V |
| C58 | 1-163-020-00 | CERAMIC CHIP 0.0082uF 10% | 50V |
| C72 | 1-109-889-11 | ELECT 1uF 20% | 50V |
| | | < CONNECTOR > | |
| * CNJ31 | 1-580-782-11 | CONNECTOR, BOARD TO BOARD | |
| * CNJ33 | 1-580-782-11 | CONNECTOR, BOARD TO BOARD | |
| CNJ72 | 1-764-902-11 | CONNECTOR, FFC/FPC 4P | |
| * CNP32 | 1-580-781-11 | PIN, CONNECTOR (PC BOARD) 7P | |
| * CNP71 | 1-564-719-11 | PIN, CONNECTOR (SMALL TYPE) 3P | |
| | | < IC > | |
| IC31 | 8-759-249-21 | IC uPC1330AGR | |
| IC32 | 8-759-106-02 | IC uPC4570G2 | |
| | | < JUMPER RESISTOR > | |
| JW1 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | |
| JW2 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | |
| JW11 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW12 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW13 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW14 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW15 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW16 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW17 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW18 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW19 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW20 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW21 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW22 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW23 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW24 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW25 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW26 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| JW27 | 1-216-296-91 | CONDUCTOR, CHIP (3216) | |
| | | < COIL > | |
| L11 | 1-410-780-11 | INDUCTOR 27mH | |
| L21 | 1-410-780-11 | INDUCTOR 27mH | |
| | | < TRANSISTOR > | |
| Q51 | 8-729-111-29 | TRANSISTOR 2SD1616A-K | |
| Q52 | 8-729-111-29 | TRANSISTOR 2SD1616A-K | |
| Q53 | 8-729-111-29 | TRANSISTOR 2SD1616A-K | |
| Q71 | 8-729-216-22 | TRANSISTOR 2SA1162-G | |
| | | < RESISTOR > | |
| R11 | 1-216-099-00 | METAL CHIP 120K 5% 1/10W | |
| R12 | 1-216-033-00 | METAL CHIP 220 5% 1/10W | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R13 | 1-216-081-00 | METAL CHIP 22K 5% 1/10W | |
| R14 | 1-216-076-00 | METAL CHIP 13K 5% 1/10W | |
| R15 | 1-216-107-00 | METAL CHIP 270K 5% 1/10W | |
| R16 | 1-249-430-11 | CARBON 12K 5% 1/4W | |
| R21 | 1-216-099-00 | METAL CHIP 120K 5% 1/10W | |
| R22 | 1-216-033-00 | METAL CHIP 220 5% 1/10W | |
| R23 | 1-216-081-00 | METAL CHIP 22K 5% 1/10W | |
| R24 | 1-216-076-00 | METAL CHIP 13K 5% 1/10W | |
| R25 | 1-216-107-00 | METAL CHIP 270K 5% 1/10W | |
| R26 | 1-249-430-11 | CARBON 12K 5% 1/4W | |
| R31 | 1-216-033-00 | METAL CHIP 220 5% 1/10W | |
| R32 | 1-216-033-00 | METAL CHIP 220 5% 1/10W | |
| R33 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R41 | 1-249-393-11 | CARBON 10 5% 1/4W | |
| R42 | 1-249-393-11 | CARBON 10 5% 1/4W | |
| R51 | 1-216-091-00 | METAL CHIP 56K 5% 1/10W | |
| R52 | 1-216-091-00 | METAL CHIP 56K 5% 1/10W | |
| R53 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R54 | 1-216-309-00 | METAL CHIP 5.6 5% 1/10W | |
| R55 | 1-216-309-00 | METAL CHIP 5.6 5% 1/10W | |
| R56 | 1-216-298-00 | METAL CHIP 2.2 5% 1/10W | |
| R71 | 1-216-082-00 | METAL GLAZE 24K 5% 1/10W | |
| R72 | 1-216-081-00 | METAL CHIP 22K 5% 1/10W | |
| R73 | 1-216-089-91 | METAL GLAZE 47K 5% 1/10W | |
| R74 | 1-216-089-91 | METAL GLAZE 47K 5% 1/10W | |
| | | < VARIABLE RESISTOR > | |
| RV11 | 1-241-761-11 | RES, ADJ, CARBON 1K | |
| RV12 | 1-238-551-11 | RES, ADJ, CARBON 220K | |
| RV21 | 1-241-761-11 | RES, ADJ, CARBON 1K | |
| RV22 | 1-238-551-11 | RES, ADJ, CARBON 220K | |
| RV71 | 1-241-630-11 | RES, ADJ, CARBON 10K | |
| RV72 | 1-241-630-11 | RES, ADJ, CARBON 10K | |
| | | < TRANSFORMER > | |
| T51 | 1-429-290-11 | TRANSFORMER, BIAS OSCILLATION | |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 1-638-020-11 | LEAF SW-A BOARD<br>*************** | |
| | | < CONNECTOR > | |
| * CNP81 | 1-568-850-11 | SOCKET, CONNECTOR 7P | |
| | | < IC > | |
| IC81 | 8-749-924-10 | IC PHONT REFLECTOR NJL5165K-B(H1) | |

# LEAF SW-A LEAF SW-B TC MAIN

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < RESISTOR > | |
| R84 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R85 | 1-249-408-11 | CARBON 180 5% 1/4W | |
| | | < SWITCH > | |
| S81 | 1-571-958-11 | SWITCH, PUSH (1 KEY) (STOP DET) | |
| S82 | 1-571-281-21 | SWITCH, LEAF (CrO2 DET) | |
| S86 | 1-571-281-21 | SWITCH, LEAF (HALF DET) | |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 1-638-020-11 | LEAF SW-B BOARD<br>*************** | |
| | | < CONNECTOR > | |
| * CNP81 | 1-568-850-11 | SOCKET, CONNECTOR 7P | |
| | | < IC > | |
| IC81 | 8-749-924-10 | IC PHONT REFLECTOR NJL5165K-B(H1) | |
| | | < RESISTOR > | |
| R81 | 1-249-414-11 | CARBON 560 5% 1/4W | |
| R82 | 1-247-818-11 | CARBON 300 5% 1/4W | |
| R83 | 1-247-834-11 | CARBON 1.3K 5% 1/4W | |
| R84 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R85 | 1-249-408-11 | CARBON 180 5% 1/4W | |
| | | < SWITCH > | |
| S81 | 1-571-958-11 | SWITCH, PUSH (1 KEY) (STOP DET) | |
| S82 | 1-571-281-21 | SWITCH, LEAF (CrO2 DET) | |
| S83 | 1-571-281-21 | SWITCH, LEAF (METAL DET) | |
| S84 | 1-571-281-21 | SWITCH, LEAF (ERASE PROOF (A)) | |
| S85 | 1-571-281-21 | SWITCH, LEAF (ERASE PROOF (B)) | |
| S86 | 1-571-281-21 | SWITCH, LEAF (HALF DET) | |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | A-2007-477-A | TC MAIN BOARD, COMPLETE<br>*********************** | |
| | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | |
| | | < CAPACITOR > | |
| C102 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C103 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C104 | 1-130-475-00 | MYLAR 0.0022uF 5% 50V | |
| C105 | 1-130-475-00 | MYLAR 0.0022uF 5% 50V | |
| C106 | 1-126-961-11 | ELECT 2.2uF 20% 50V | |
| C107 | 1-136-174-00 | FILM 0.56uF 5% 50V | |
| C108 | 1-136-171-00 | FILM 0.33uF 5% 50V | |
| C109 | 1-126-961-11 | ELECT 2.2uF 20% 50V | |
| C110 | 1-126-961-11 | ELECT 2.2uF 20% 50V | |
| C111 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C114 | 1-124-907-11 | ELECT 10uF 20% 50V | |
| C115 | 1-124-443-00 | ELECT 100uF 20% 10V | |
| C116 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C119 | 1-124-902-00 | ELECT 0.47uF 20% 50V | |
| C120 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C130 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C131 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C132 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C133 | 1-162-286-31 | CERAMIC 220PF 10% 50V | |
| C202 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C203 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C204 | 1-130-475-00 | MYLAR 0.0022uF 5% 50V | |
| C205 | 1-130-475-00 | MYLAR 0.0022uF 5% 50V | |
| C206 | 1-126-961-11 | ELECT 2.2uF 20% 50V | |
| C207 | 1-136-174-00 | FILM 0.56uF 5% 50V | |
| C208 | 1-136-171-00 | FILM 0.33uF 5% 50V | |
| C209 | 1-126-961-11 | ELECT 2.2uF 20% 50V | |
| C210 | 1-126-961-11 | ELECT 2.2uF 20% 50V | |
| C211 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C214 | 1-124-907-11 | ELECT 10uF 20% 50V | |
| C215 | 1-124-443-00 | ELECT 100uF 20% 10V | |
| C216 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C219 | 1-124-902-00 | ELECT 0.47uF 20% 50V | |
| C220 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C230 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C231 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C232 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C233 | 1-162-286-31 | CERAMIC 220PF 10% 50V | |
| C502 | 1-126-944-11 | ELECT 3300uF 20% 16V | |
| C504 | 1-126-944-11 | ELECT 3300uF 20% 16V | |
| C518 | 1-124-907-11 | ELECT 10uF 20% 50V | |
| C519 | 1-124-907-11 | ELECT 10uF 20% 50V | |
| C529 | 1-136-157-00 | FILM 0.022uF 5% 50V | |
| C530 | 1-136-157-00 | FILM 0.022uF 5% 50V | |
| C533 | 1-136-157-00 | FILM 0.022uF 5% 50V | |
| C534 | 1-136-157-00 | FILM 0.022uF 5% 50V | |
| C535 | 1-126-942-61 | ELECT 1000uF 20% 16V | |
| C536 | 1-126-942-61 | ELECT 1000uF 20% 16V | |
| C537 | 1-124-472-11 | ELECT 470uF 20% 10V | |
| C538 | 1-124-472-11 | ELECT 470uF 20% 10V | |
| C540 | 1-126-926-11 | ELECT 1000uF 20% 10V | |
| C601 | 1-124-443-00 | ELECT 100uF 20% 10V | |
| C602 | 1-164-159-11 | CERAMIC 0.1uF 50V | |
| C603 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C604 | 1-164-159-11 | CERAMIC 0.1uF 50V | |
| C606 | 1-124-480-11 | ELECT 470uF 20% 25V | |
| C607 | 1-124-480-11 | ELECT 470uF 20% 25V | |
| C608 | 1-124-480-11 | ELECT 470uF 20% 25V | |

| Ref. No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| C609 | 1-124-902-00 | ELECT | 0.47uF | 20% | 50V |
| C610 | 1-124-472-11 | ELECT | 470uF | 20% | 10V |
| C611 | 1-162-290-31 | CERAMIC | 470PF | 10% | 50V |
| C612 | 1-124-472-11 | ELECT | 470uF | 20% | 10V |
| C613 | 1-162-290-31 | CERAMIC | 470PF | 10% | 50V |
| C614 | 1-164-159-11 | CERAMIC | 0.1uF | | 50V |
| C615 | 1-164-159-11 | CERAMIC | 0.1uF | | 50V |
| C616 | 1-124-910-11 | ELECT | 47uF | 20% | 50V |
| C617 | 1-164-159-11 | CERAMIC | 0.1uF | | 50V |
| C620 | 1-124-907-11 | ELECT | 10uF | 20% | 50V |
| C621 | 1-124-907-11 | ELECT | 10uF | 20% | 50V |
| C622 | 1-124-477-11 | ELECT | 47uF | 20% | 25V |
| C623 | 1-124-477-11 | ELECT | 47uF | 20% | 25V |
| C630 | 1-126-963-11 | ELECT | 4.7uF | 20% | 50V |
| C631 | 1-124-903-11 | ELECT | 1uF | 20% | 50V |
| C636 | 1-126-965-11 | ELECT | 22uF | 20% | 50V |
| C641 | 1-126-963-11 | ELECT | 4.7uF | 20% | 50V |
| C642 | 1-124-902-00 | ELECT | 0.47uF | 20% | 50V |
| C645 | 1-124-907-11 | ELECT | 10uF | 20% | 50V |
| C646 | 1-126-961-11 | ELECT | 2.2uF | 20% | 50V |
| C649 | 1-124-907-11 | ELECT | 10uF | 20% | 50V |
| C650 | 1-126-965-11 | ELECT | 22uF | 20% | 50V |
| C651 | 1-124-443-00 | ELECT | 100uF | 20% | 10V |
| C800 | 1-162-286-31 | CERAMIC | 220PF | 10% | 50V |
| C6035 | 1-162-294-31 | CERAMIC | 0.001uF | 10% | 50V |

< CONNECTOR >

| Ref. No. | Part No. | Description |
|---|---|---|
| CN601 | 1-695-330-31 | PIN, CONNECTOR (PC BOARD) 7P |
| * CN602 | 1-691-916-11 | CONNECTOR, BOARD TO BOARD |
| CN603 | 1-695-330-31 | PIN, CONNECTOR (PC BOARD) 7P |
| * CN604 | 1-691-916-11 | CONNECTOR, BOARD TO BOARD |
| * CN605 | 1-691-916-11 | CONNECTOR, BOARD TO BOARD |
| CN608 | 1-770-166-11 | CONNECTOR, FFC/FPC 17P |
| CN609 | 1-770-158-21 | HOUSING, CONNECTOR 7P (SYSTEM CONTROL) |

< DIODE >

| Ref. No. | Part No. | Description | |
|---|---|---|---|
| D508 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D509 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D510 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D511 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D512 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D513 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D519 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D522 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D523 | 8-719-987-63 | DIODE | 1N4148M |
| D524 | 8-719-987-63 | DIODE | 1N4148M |
| D525 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D526 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D601 | 8-719-987-63 | DIODE | 1N4148M |
| D602 | 8-719-987-63 | DIODE | 1N4148M |
| D603 | 8-719-987-63 | DIODE | 1N4148M |
| D604 | 8-719-987-63 | DIODE | 1N4148M |
| D605 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D606 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D607 | 8-719-987-63 | DIODE | 1N4148M |
| D608 | 8-719-987-63 | DIODE | 1N4148M |
| D610 | 8-719-024-99 | DIODE | 11ES2-NTA2B |
| D611 | 8-719-987-63 | DIODE | 1N4148M |
| D620 | 8-719-012-68 | DIODE | UZ-2.7BSA-TP |

< IC >

| Ref. No. | Part No. | Description | |
|---|---|---|---|
| IC101 | 8-752-058-57 | IC | CXA1599Q |
| IC102 | 8-759-939-73 | IC | BA3308 |
| IC103 | 8-752-059-55 | IC | CXA1331S |
| IC104 | 8-759-337-73 | IC | M38123M4-118FP |
| IC502 | 8-759-231-53 | IC | TA7805S |
| IC503 | 8-759-604-86 | IC | M5F7807L |
| IC504 | 8-759-604-90 | IC | M5F7907L |
| IC505 | 8-759-604-86 | IC | M5F7807L |
| IC506 | 8-759-604-90 | IC | M5F7907L |
| IC602 | 8-759-256-72 | IC | PST994D |
| IC603 | 8-759-266-35 | IC | TA8242AK |
| IC6004 | 8-759-000-48 | IC | MC14052BCP |

< COIL >

| Ref. No. | Part No. | Description | |
|---|---|---|---|
| L601 | 1-414-189-31 | INDUCTOR | 100uH |
| L6002 | 1-414-183-41 | INDUCTOR | 10uH |

< JACK >

| Ref. No. | Part No. | Description |
|---|---|---|
| PJ101 | 1-695-188-31 | JACK, PIN 4P (TAPE IN/OUT) |

< TRANSISTOR >

| Ref. No. | Part No. | Description | |
|---|---|---|---|
| Q101 | 8-729-119-78 | TRANSISTOR | 2SC2785-HFE |
| Q122 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q201 | 8-729-119-78 | TRANSISTOR | 2SC2785-HFE |
| Q222 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q603 | 8-729-801-93 | TRANSISTOR | 2SD1387 |
| Q604 | 8-729-801-93 | TRANSISTOR | 2SD1387 |
| Q605 | 8-729-900-80 | TRANSISTOR | DTC114ES |
| Q607 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q608 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q609 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q611 | 8-729-119-78 | TRANSISTOR | 2SC2785-HFE |
| Q612 | 8-729-119-76 | TRANSISTOR | 2SA1175-HFE |
| Q613 | 8-729-900-65 | TRANSISTOR | DTA144ES |
| Q614 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q620 | 8-729-900-89 | TRANSISTOR | DTC144ES |
| Q621 | 8-729-900-65 | TRANSISTOR | DTA144ES |
| Q627 | 8-729-900-89 | TRANSISTOR | DTC144ES |

# TC MAIN

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| Q630 | 8-729-422-57 | TRANSISTOR | UN4111 | | | |
| Q802 | 8-729-900-80 | TRANSISTOR | DTC114ES | | | |
| Q803 | 8-729-900-80 | TRANSISTOR | DTC114ES | | | |
| Q804 | 8-729-900-80 | TRANSISTOR | DTC114ES | | | |
| Q805 | 8-729-900-80 | TRANSISTOR | DTC114ES | | | |
| | | < RESISTOR > | | | | |
| R106 | 1-249-418-11 | CARBON | 1.2K | 5% | 1/4W | |
| R107 | 1-247-864-11 | CARBON | 24K | 5% | 1/4W | |
| R108 | 1-249-414-11 | CARBON | 560 | 5% | 1/4W | |
| R109 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R110 | 1-249-427-11 | CARBON | 6.8K | 5% | 1/4W | |
| R111 | 1-249-427-11 | CARBON | 6.8K | 5% | 1/4W | |
| R112 | 1-247-832-11 | CARBON | 1.1K | 5% | 1/4W | |
| R113 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R114 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R115 | 1-247-887-00 | CARBON | 220K | 5% | 1/4W | |
| R116 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R117 | 1-249-419-11 | CARBON | 1.5K | 5% | 1/4W | |
| R118 | 1-249-438-11 | CARBON | 56K | 5% | 1/4W | |
| R119 | 1-247-834-11 | CARBON | 1.3K | 5% | 1/4W | |
| R120 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R121 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R122 | 1-249-426-11 | CARBON | 5.6K | 5% | 1/4W | |
| R206 | 1-249-418-11 | CARBON | 1.2K | 5% | 1/4W | |
| R207 | 1-247-864-11 | CARBON | 24K | 5% | 1/4W | |
| R208 | 1-249-414-11 | CARBON | 560 | 5% | 1/4W | |
| R209 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R210 | 1-249-427-11 | CARBON | 6.8K | 5% | 1/4W | |
| R211 | 1-249-427-11 | CARBON | 6.8K | 5% | 1/4W | |
| R212 | 1-247-832-11 | CARBON | 1.1K | 5% | 1/4W | |
| R213 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R214 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R215 | 1-247-887-00 | CARBON | 220K | 5% | 1/4W | |
| R216 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R217 | 1-249-419-11 | CARBON | 1.5K | 5% | 1/4W | |
| R218 | 1-249-438-11 | CARBON | 56K | 5% | 1/4W | |
| R219 | 1-247-834-11 | CARBON | 1.3K | 5% | 1/4W | |
| R220 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R221 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R222 | 1-249-426-11 | CARBON | 5.6K | 5% | 1/4W | |
| R504 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R505 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R601 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R602 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R606 | 1-249-435-11 | CARBON | 33K | 5% | 1/4W | |
| R607 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R615 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R616 | 1-249-433-11 | CARBON | 22K | 5% | 1/4W | |
| R620 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| ⚠R621 | 1-212-853-00 | FUSIBLE | 6.8 | 5% | 1/4W | F |
| R622 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R623 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R624 | 1-249-434-11 | CARBON | 27K | 5% | 1/4W | |
| R625 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R626 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R627 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R628 | 1-249-434-11 | CARBON | 27K | 5% | 1/4W | |
| R629 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R630 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R631 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R632 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R633 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R634 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R637 | 1-249-414-11 | CARBON | 560 | 5% | 1/4W | |
| R640 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R641 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R642 | 1-249-424-11 | CARBON | 3.9K | 5% | 1/4W | |
| R648 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R649 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R650 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R656 | 1-249-393-11 | CARBON | 10 | 5% | 1/4W | |
| R660 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R661 | 1-249-434-11 | CARBON | 27K | 5% | 1/4W | |
| R670 | 1-249-433-11 | CARBON | 22K | 5% | 1/4W | |
| R673 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R674 | 1-247-860-11 | CARBON | 16K | 5% | 1/4W | |
| R675 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R676 | 1-249-434-11 | CARBON | 27K | 5% | 1/4W | |
| R677 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R678 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R679 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R680 | 1-249-433-11 | CARBON | 22K | 5% | 1/4W | |
| R681 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R682 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R683 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R684 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| R685 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R686 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R687 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R689 | 1-247-872-11 | CARBON | 51K | 5% | 1/4W | |
| R690 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R691 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R693 | 1-249-433-11 | CARBON | 22K | 5% | 1/4W | |
| R694 | 1-249-433-11 | CARBON | 22K | 5% | 1/4W | |
| R695 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R696 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R700 | 1-247-903-00 | CARBON | 1M | 5% | 1/4W | |
| R701 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R702 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MC-Service

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R801 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R802 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R803 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R804 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R805 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R807 | 1-249-433-11 | CARBON 22K 5% 1/4W | |
| R808 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R809 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R810 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R813 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R814 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R815 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R816 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R817 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R818 | 1-249-435-11 | CARBON 33K 5% 1/4W | |
| R819 | 1-249-393-11 | CARBON 10 5% 1/4W | |
| R820 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R821 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R822 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R823 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R6070 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R6071 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |

< VARIABLE RESISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| RV101 | 1-238-600-11 | RES, ADJ, CARBON 10K | |
| RV201 | 1-238-600-11 | RES, ADJ, CARBON 10K | |

< VIBRATOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| X601 | 1-577-358-21 | VIBRATOR, CERAMIC (4MHz) | |

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* A-2007-478-A TC PANEL BOARD, COMPLETE

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< CONNECTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| CN900 | 1-770-169-11 | CONNECTOR, FFC/FPC 17P | |

< DIODE >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| D900 | 8-719-046-43 | DIODE SEL5421E-TP15 (▷ DECK A) | |
| D901 | 8-719-046-43 | DIODE SEL5421E-TP15 (◁ DECK A) | |
| D902 | 8-719-046-43 | DIODE SEL5421E-TP15 (▷ DECK B) | |
| D903 | 8-719-046-43 | DIODE SEL5421E-TP15 (◁ DECK B) | |
| D906 | 8-719-046-44 | DIODE SEL5221S (CD SYNC) | |
| D907 | 8-719-046-44 | DIODE SEL5221S (HIGH) | |
| D908 | 8-719-046-44 | DIODE SEL5221S (NORMAL) | |
| D909 | 8-719-046-36 | DIODE SEL5921A-TP15 (❚❚) | |
| D910 | 8-719-046-44 | DIODE SEL5221S (REC) | |

< RESISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R900 | 1-249-418-11 | CARBON 1.2K 5% 1/4W | |
| R901 | 1-249-420-11 | CARBON 1.8K 5% 1/4W | |
| R902 | 1-249-422-11 | CARBON 2.7K 5% 1/4W | |
| R903 | 1-249-424-11 | CARBON 3.9K 5% 1/4W | |
| R904 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | |
| R905 | 1-249-418-11 | CARBON 1.2K 5% 1/4W | |
| R906 | 1-249-420-11 | CARBON 1.8K 5% 1/4W | |
| R907 | 1-249-422-11 | CARBON 2.7K 5% 1/4W | |
| R908 | 1-249-424-11 | CARBON 3.9K 5% 1/4W | |
| R909 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | |
| R910 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R911 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R914 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | |
| R915 | 1-249-434-11 | CARBON 27K 5% 1/4W | |
| R916 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |

< SWITCH >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| S900 | 1-762-205-11 | SWITCH, SLIDE (DIRECTION MODE) | |
| S901 | 1-762-205-11 | SWITCH, SLIDE (DOLBY NR) | |
| S902 | 1-554-303-21 | SWITCH, TACTILE (■ DECK B) | |
| S903 | 1-554-303-21 | SWITCH, TACTILE (▷ DECK B) | |
| S904 | 1-554-303-21 | SWITCH, TACTILE (◁ DECK B) | |
| S905 | 1-554-303-21 | SWITCH, TACTILE (❚❚ PAUSE, DECK B) | |
| S906 | 1-554-303-21 | SWITCH, TACTILE (◀◀ DECK A) | |
| S907 | 1-554-303-21 | SWITCH, TACTILE (▶▶ DECK A) | |
| S908 | 1-554-303-21 | SWITCH, TACTILE (■ DECK A) | |
| S909 | 1-554-303-21 | SWITCH, TACTILE (▷ DECK A) | |
| S910 | 1-554-303-21 | SWITCH, TACTILE (◁ DECK A) | |
| S911 | 1-554-303-21 | SWITCH, TACTILE (◀◀ DECK B) | |
| S912 | 1-554-303-21 | SWITCH, TACTILE (▶▶ DECK B) | |
| S913 | 1-554-303-21 | SWITCH, TACTILE (● REC) | |
| S915 | 1-554-303-21 | SWITCH, TACTILE (DUBBING MODE) | |
| S916 | 1-554-303-21 | SWITCH, TACTILE (CD SYNC) | |
| S917 | 1-554-303-21 | SWITCH, TACTILE (○ REC MUTE) | |

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MISCELLANEOUS

*************

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 58 | 1-769-390-11 | WIRE (FLAT TYPE) (17 CORE) | |
| 73 | 1-765-384-11 | WIRE (FLAT TYPE) (7 CORE) | |
| HP1 | A-2003-757-A | BASE ASSY, HEAD (PB) (DECK A) | |
| HRPE1 | A-2003-930-A | BASE ASSY, HEAD (PB/REC/ERASE) (DECK A) | |
| IC81 | 8-749-924-10 | IC PHONT REFLECTOR NJL5165K-B(HI) | |
| M1 | X-3363-501-2 | MOTOR ASSY (REEL) | |
| M2 | X-3365-377-2 | MOTOR ASSY (CAPSTAN) | |

****************************************************************

MC-Service

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | ACCESSORIES & PACKING MATERIALS<br>******************************* | |
| * | 3-933-134-01 | CUSHION (LOWER) | |
| * | 3-933-164-01 | CUSHION (UPPER) | |

**************************************************************

*******************

## HARDWARE LIST

*******************

| Ref. No. | Part No. | Description |
|---|---|---|
| #1 | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S |
| #2 | 7-621-770-67 | SCREW +BVTT 2.6X6 (S) |
| #3 | 7-621-775-00 | SCREW +B 2.6X3 |
| #4 | 7-627-556-08 | SCREW +P 2.6X2.8 |
| #5 | 7-685-647-79 | SCREW +BVTP 3X10 TYPE2 N-S |

*MC-Service*

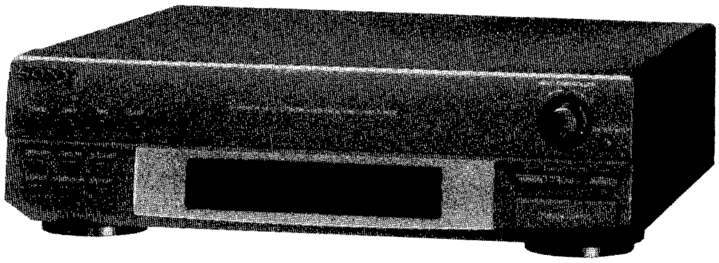
**Sony Corporation**
**Consumer A&V Products Company**
**Home A&V Products Div.**

**English**
96B0978-1
Printed in Japan
© 1996. 2
**Published by Home A&V Products Div.**
**Quality Engineering Dept.**

# ST-EX100

# SERVICE MANUAL

*AEP Model*
*UK Model*
*E Model*



This set is the tuner section in MHC-EX50/EX70AV/EX90/EX100AV.

**Photo : E mode (SILVER)**

## SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

***FM tuner section***

| | |
|---|---|
| Tuning range | 87.5 – 108.0 MHz (50 kHz step) |
| Aerial | FM lead aerial |
| Aerial terminals | 75 ohm unbalanced |
| Intermediate frequency | 10.7 MHz |

***AM tuner section***

| | |
|---|---|
| Tuning range | |
| Italian model: AM: | 522 – 1,611 kHz (with the interval set at 9 kHz) |
| German model: AM: | 531 – 1,602 kHz (with the interval set at 9 kHz) |
| E, Saudi Arabia, Thailand models: AM: | 531 – 1,602 kHz (with the interval set at 9 kHz)<br>530 – 1,710 kHz (with the interval set at 10 kHz) |
| Other models: MW: | 531 – 1,602 kHz (with the interval set at 9 kHz) |
| LW: | 153 – 279 kHz (with the interval set at 3 kHz) |
| Aerial | AM loop aerial, External aerial terminals |
| Intermediate frequency | 450 kHz |
| Dimensions | Approx. 280 x 82.5 x 285 mm (11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d) incl. projecting parts and controls |
| Mass | Approx. 1.5 kg (3 lb 4 oz) |

## FM STEREO/FM-AM TIMER TUNER

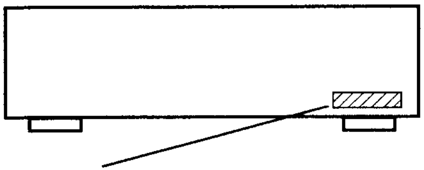
SONY®

MICROFILM

MC-Service

## MODEL IDENTIFICATION

— Back Panel —



4-978-999-0☐...E model
4-978-999-1☐...AEP, UK, German, Italian, CIS model (Made in France)
4-978-999-2☐...AEP, UK model (Made in Malaysia)
4-978-999-3☐...Saudi Arabia model
4-978-999-4☐...Thailand model

## TABLE OF CONTENTS

Section Title Page

SECTION 1. SERVICING NOTE .................................... 3

SECTION 2. GENERAL .................................................. 4

SECTION 3. DISASSEMBLY
3-1. Panel Board ...................................................................... 5
3-2. Back Panel, Main Board and Polar Board ...................... 5

SECTION 4. ELECTRICAL ADJUSTMENTS ................. 6

SECTION 5. DIAGRAMS
5-1. IC Block Diagrams ........................................................... 8
5-2. Printed Wiring Board ....................................................... 11
5-3. Schematic Diagram ......................................................... 13
5-4. IC Pin Function
• IC201 System Control (μPD78013GC) ........................ 17

SECTION 6. EXPLODED VIEW ..................................... 19

SECTION 7. ELECTRICAL PARTS LIST ....................... 20

**SAFETY-RELATED COMPONENT WARNING !!**

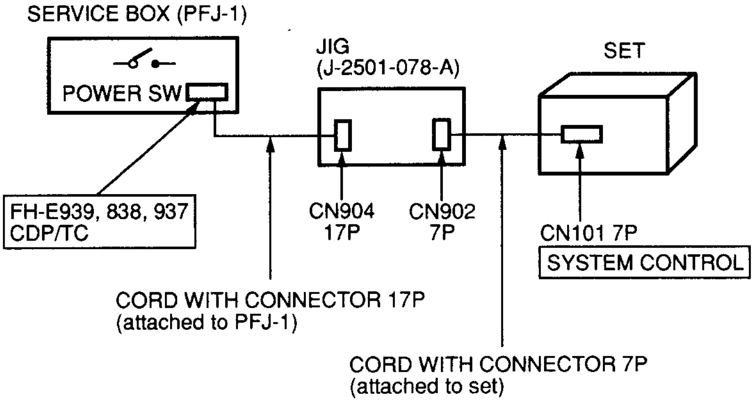
**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

# SECTION 1

# SERVICING NOTE

### How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ENTER/NEXT button and SLEEP button at the same time to turn the power on.



SERVICE BOX (PFJ-1)
POWER SW
JIG
(J-2501-078-A)
SET
FH-E939, 838, 937
CDP/TC
CN904
17P
CN902
7P
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

### • KEY/FL tube/LED check mode.

To enter KEY/FL/LED check mode, press the ENTER/NEXT and REC buttons at the same time.
Under mode, every time when press any key or turn MULTI CONTROLLER knob, change to next situation.

① All LED indicators light on
② All FL tube indicators light on
③ A part of FL tube light on mode 1. (Indicated ST-SEG)
④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
⑤ KEY check mode

**Note :**

1) All LED light on mode is keeped, when buttons which is pressed to enter all LED light on mode, release same time.
When release them separate timing, it is moved to next All LED light on mode.

2) After all LED light on mode, light on point remove one by one, when any button pressed or MULTI CONTROLLER knob turned.

3) Under KEY check mode, every time buttons pressed numerical value of “KEY” in FL tube increse.
And that time, numerical value of “ECDR” increse when MULTI CONTROLLER button turn to + direction, and it decrese turn to – direction.

When you want to finish this mode, unplug the power of amplifire or turn off PFJ-1 of POWER switch.

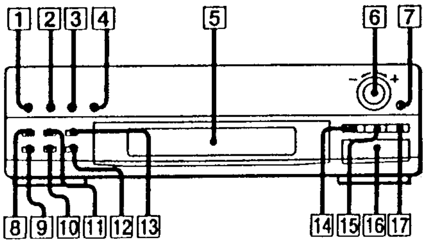
*MC-Service*

# SECTION 2
# GENERAL

This section is extracted from instruction manual.

## Index to Parts and Controls

### Front Panel

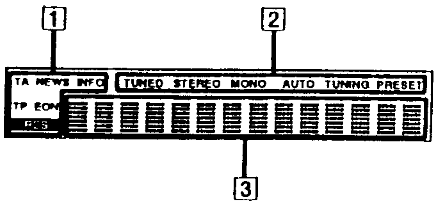


1 ONCE button* (25, 26)
2 DAILY button* (25, 26)
3 REC button* (26)
4 SLEEP button* (25)
5 Display window (6, 10, 25)
6 MULTI CONTROLLER*
(6, 10, 11, 13, 26)
7 ENTER/NEXT button* (6, 11, 26)
8 CHARACTER button (11)
9 EON (Enhanced Other Networks)
button (12) (AEP, UK, G, IT)
MEMORY button (E, EA, CIS,TH)
10 PTY (Programme Type) button (13)
(AEP, G, IT, UK)
STEREO/MONO button
(E, EA, CIS, TH)
11 TIMER SET button (25)
12 DISPLAY button (11, 12)
13 CLOCK SET button (6)
14 STEREO/MONO button (10)
MANUAL button (E, EA, CIS, TH)
15 TUNING MODE button (10)
(AEP, UK, G, IT)
AUTO button
(E, EA, CIS, TH)
16 TUNER/BAND button (10, 18, 30)
17 MEMORY button (11)
(AEP, UK, G, IT)
PRESET button (E, EA, CIS, TH)

- Abbreviation

| | |
|---|---|
| G | : German model. |
| IT | : Italian model. |
| EA | : Saudi Arabia model. |
| TH | : Thailand model |

### Display Window



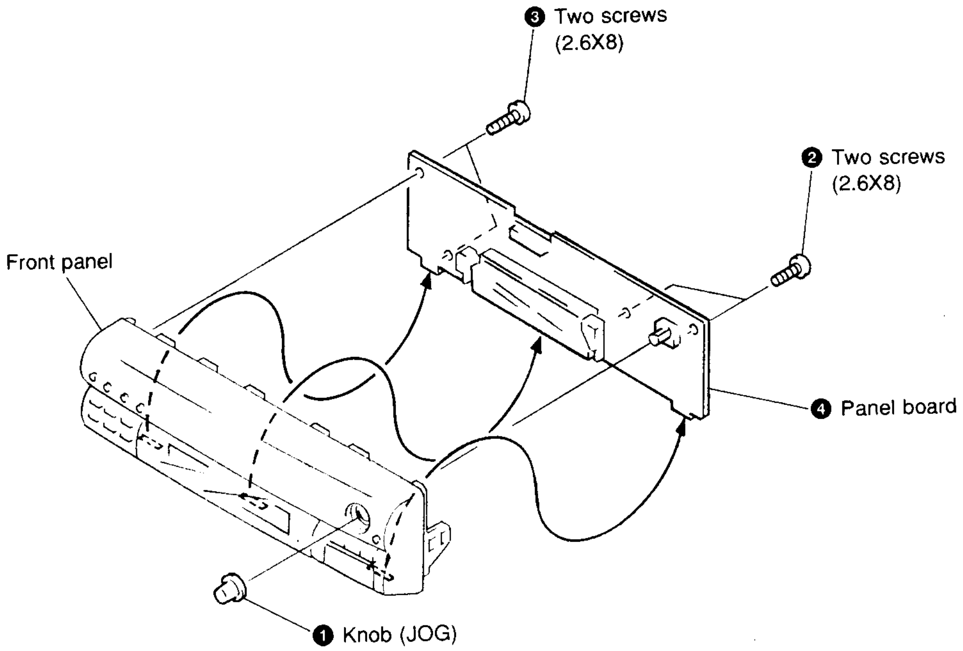
1 RDS service indications (12) (AEP, UK, G, IT)
2 Tuner indication (10)
3 Frequency/station name/time/timer
indication (6, 10, 11, 25)

# SECTION 3

# DISASSEMBLY

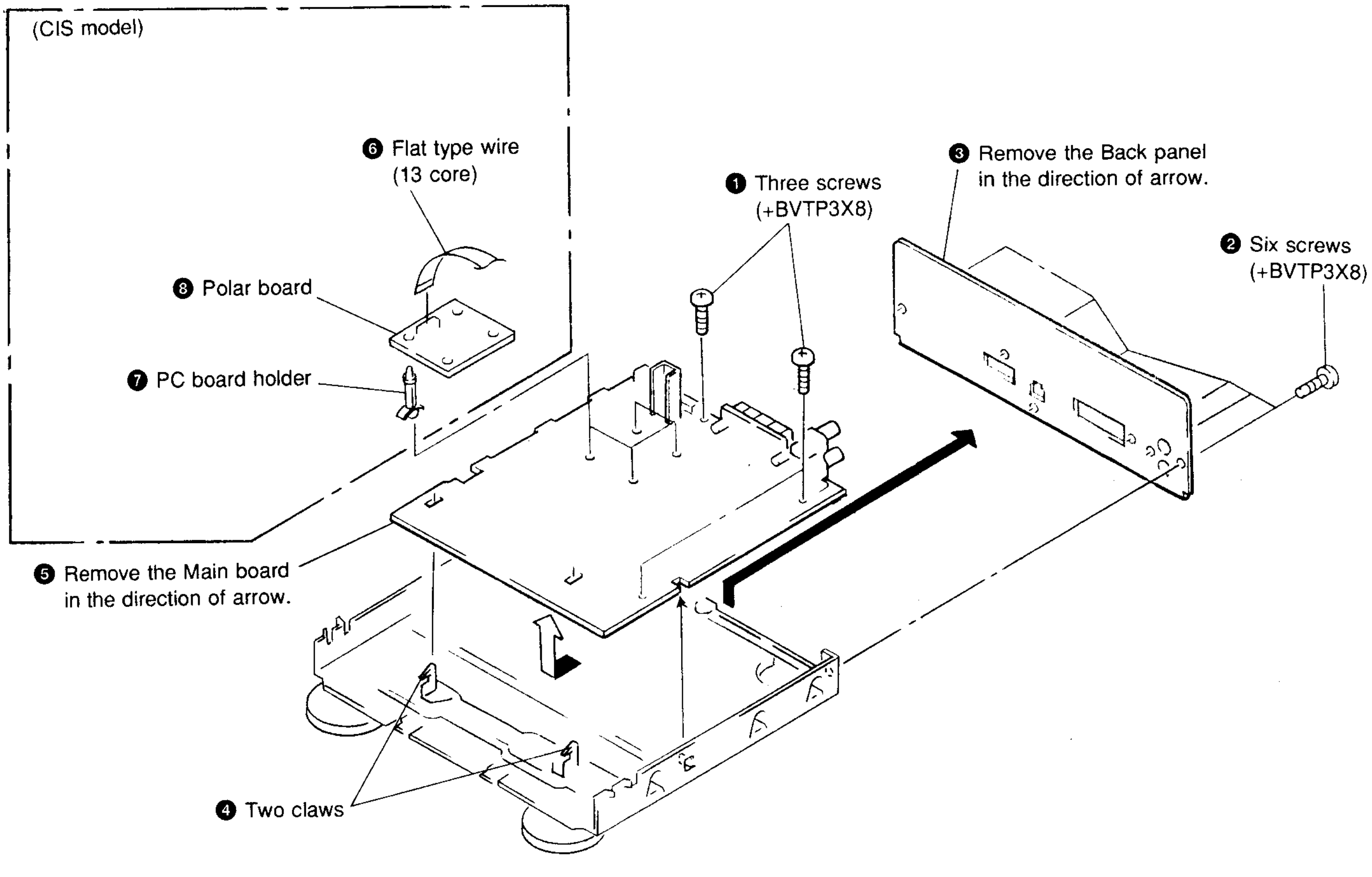
**Note :** Follow the disassembly procedure in the numerical order given.

## 3-1. PANEL BOARD



❸ Two screws (2.6X8)
❷ Two screws (2.6X8)
Front panel
❹ Panel board
❶ Knob (JOG)

## 3-2. BACK PANEL, MAIN BOARD AND POLAR BOARD



(CIS model)
❻ Flat type wire (13 core)
❽ Polar board
❼ PC board holder
❶ Three screws (+BVTP3X8)
❸ Remove the Back panel in the direction of arrow.
❷ Six screws (+BVTP3X8)
❺ Remove the Main board in the direction of arrow.
❹ Two claws

# SECTION 4

# ELECTRICAL ADJUSTMENTS

### Precautions in Repairing

If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

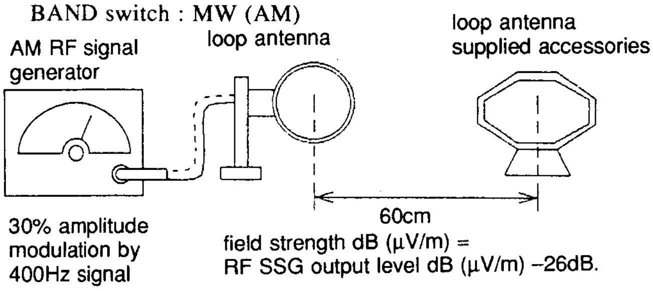
| The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed. |
|---|

## AM SECTION

### AM Tuning Level Adjustment

**Setting :**

BAND switch : MW (AM)


AM RF signal generator
loop antenna
loop antenna supplied accessories
60cm
30% amplitude modulation by 400Hz signal
field strength dB (μV/m) = RF SSG output level dB (μV/m) −26dB.

Carrier frequency : 999kHz (at 9k step)
1,000kHz (at 10k step)
Output level : 25dBμ

**Procedure :**

1. Set loop antenna A so that the loop antenna B input level becomes 55dBμ/m.
2. Tune the set to 999kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

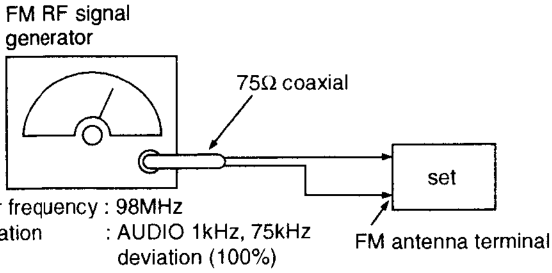
**Adjustment Location :** MAIN board. (See page 7)

## FM SECTION

### FM Tuning Level Adjustment

**Setting :**

BAND switch : FM


FM RF signal generator
75Ω coaxial
set
FM antenna terminal

Carrier frequency : 98MHz
Moduration : AUDIO 1kHz, 75kHz deviation (100%)
Output level : 26dBμ (17.8μV)

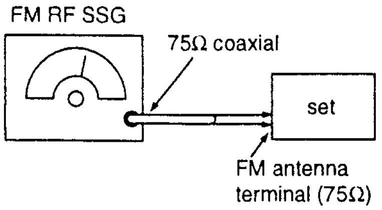
**Procedure :**

1. Tune the set to 98MHz.
2. Adjust RV2 so that the TUNED indicator goes on.

**Adjustment Location :** MAIN board. (See page 7)

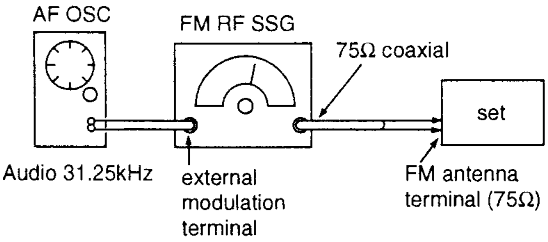
### FM Polar Adjustment (CIS model only)

### Connection 1 :


FM RF SSG
75Ω coaxial
set
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBμ) (at 75Ω open)
Modulation : AUDIO 1kHz, 10kHz deviation

### Connection 2 :


AF OSC
FM RF SSG
75Ω coaxial
set
Audio 31.25kHz
external modulation terminal
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBμ) (at 75Ω open)
Modulation : AUDIO 31.25kHz, 10kHz deviation (EXTERNAL MODULATION)

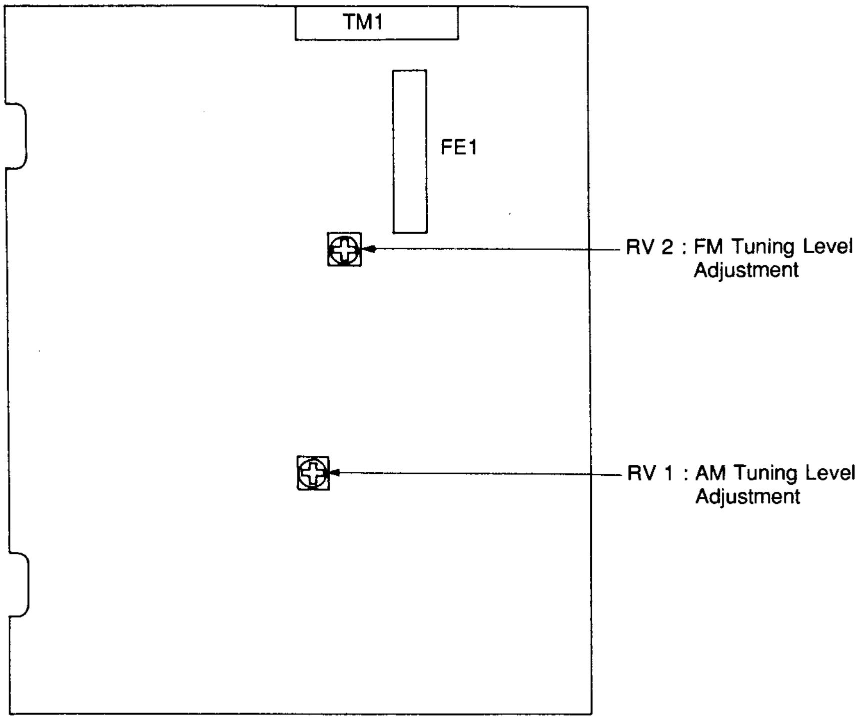
**Procedure :**

1. Set the modulation of FM RF SSG to AUDIO 1 kHz, 10 kHz deviation according to "Connection 1".
2. Tune the set to 69 MHz.
3. Adjust the RV1702 so that the reading of frequency counter connected to TP1702 becomes within 31.25 kHz ± 0.05 kHz. (VCO frequency adjustment)
4. Then record the reading of the level meter connected to TP1701.
5. Set the modulation of FM RF SSG to AUDIO 31.25 kHz, 10 kHz deviation according to "Connection 2".
6. Tune the set to 69 MHz.
7. Set the CT1701 to be mechanical center.
8. Adjust the L1701 so that the reading of the level meter connected to TP1701 becomes maximum.
   Then adjust the CT1701 so that the reading of the level meter connected to TP1701 becomes maximum. (SUB CARRIER PEAK Adjustment)
9. Adjust the RV1701 so that the level at the moment becomes 14 dB higher value than the level recorded in step 4. (SUB CARRIER LEVEL Adjustment)

**Adjustment Location :** Polar board. (See page 7)

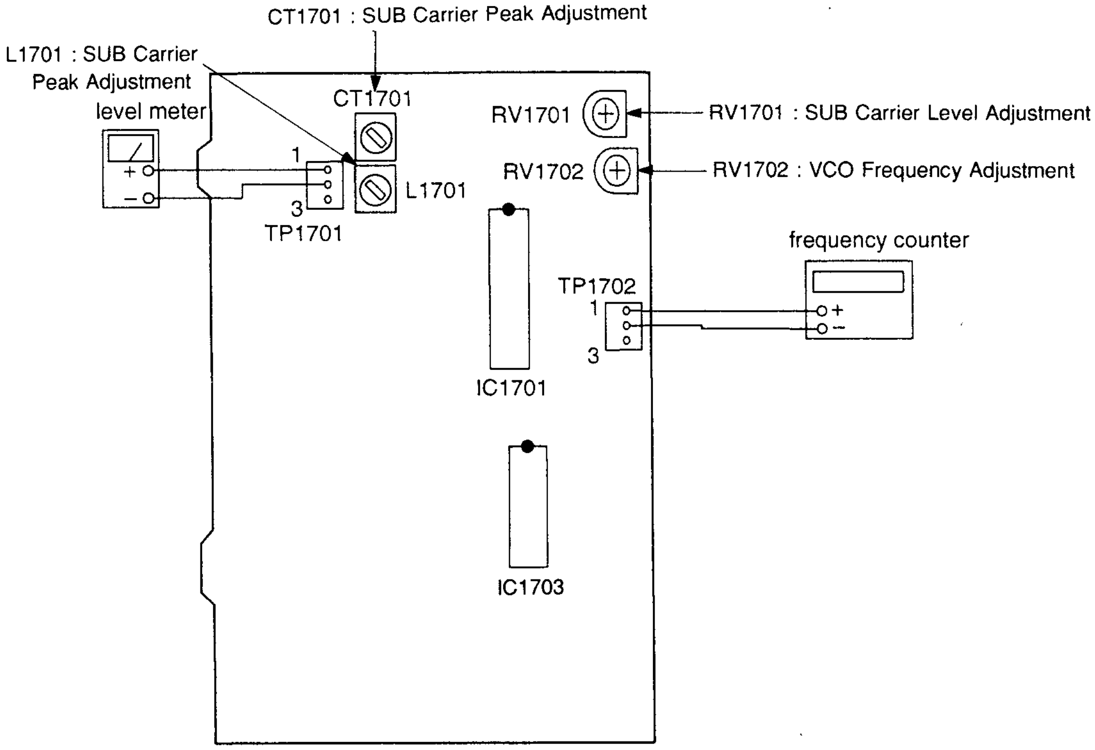
## Adjustment Location

**[MAIN BOARD]** — Component side —



TM1
FE1
RV 2 : FM Tuning Level Adjustment
RV 1 : AM Tuning Level Adjustment

**[POLAR BOARD]** — Component side —



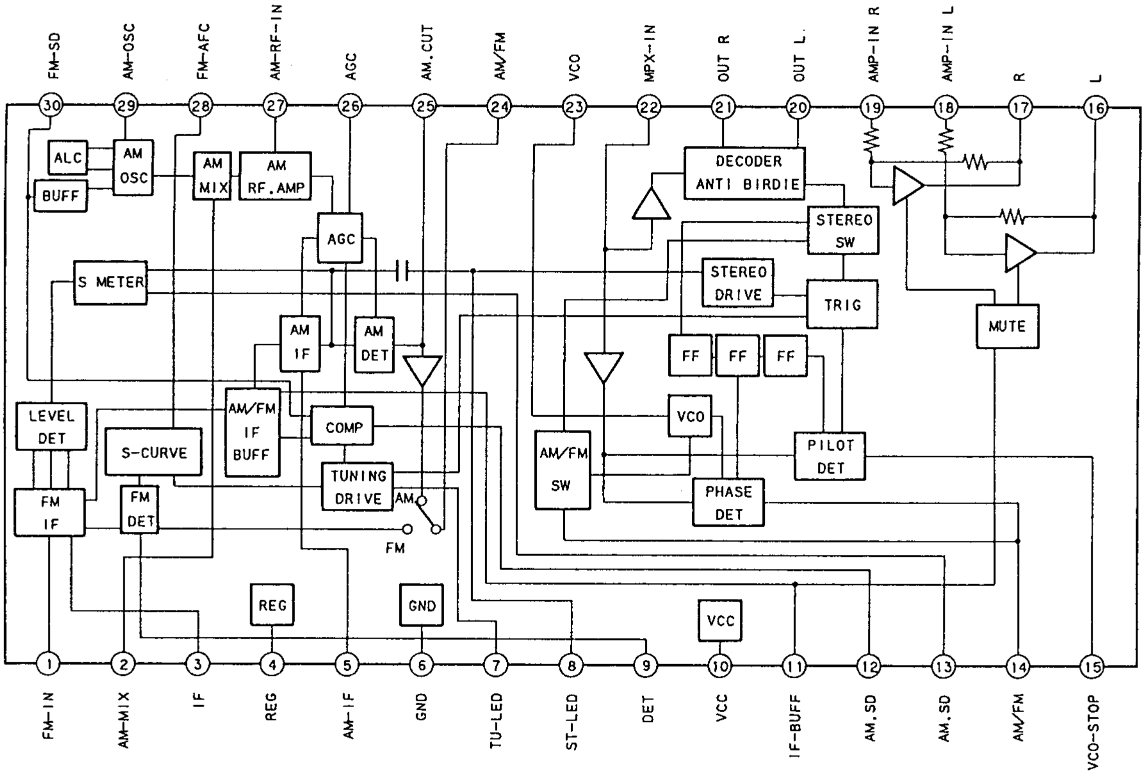
CT1701 : SUB Carrier Peak Adjustment
L1701 : SUB Carrier Peak Adjustment
level meter
+
−
1
3
TP1701
CT1701
L1701
RV1701
RV1702
RV1701 : SUB Carrier Level Adjustment
RV1702 : VCO Frequency Adjustment
frequency counter
TP1702
1
3
+
−
IC1701
IC1703

MC-Service

# SECTION 5
# DIAGRAMS

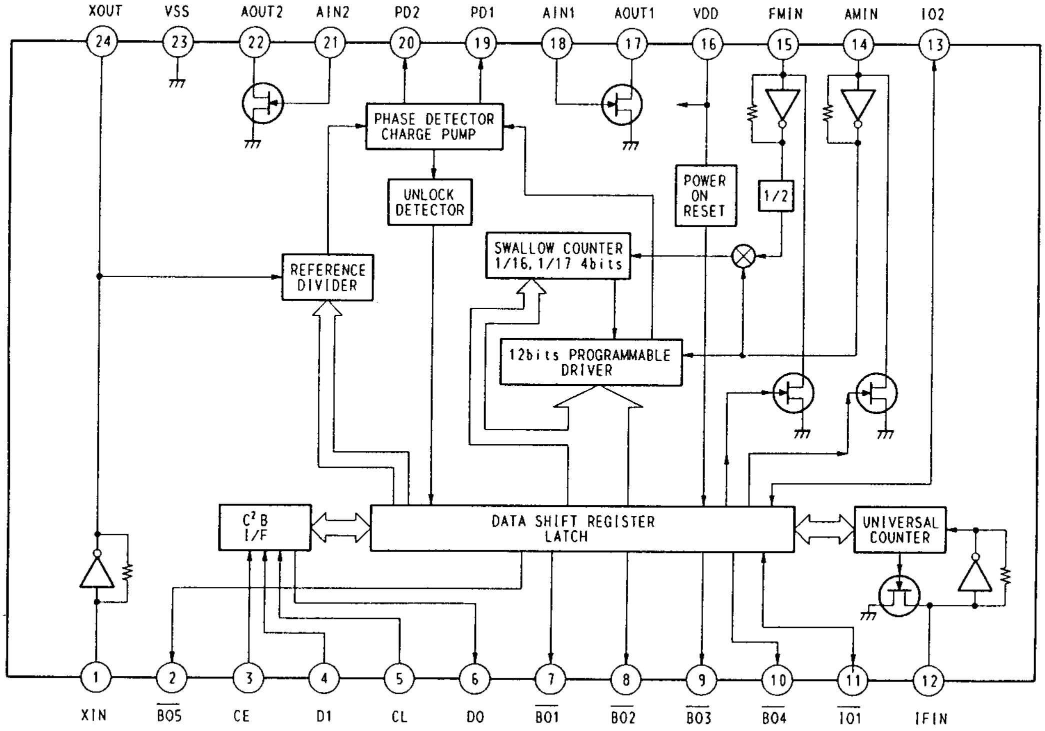
## 5-1. IC BLOCK DIAGRAMS

### IC1 LA1835



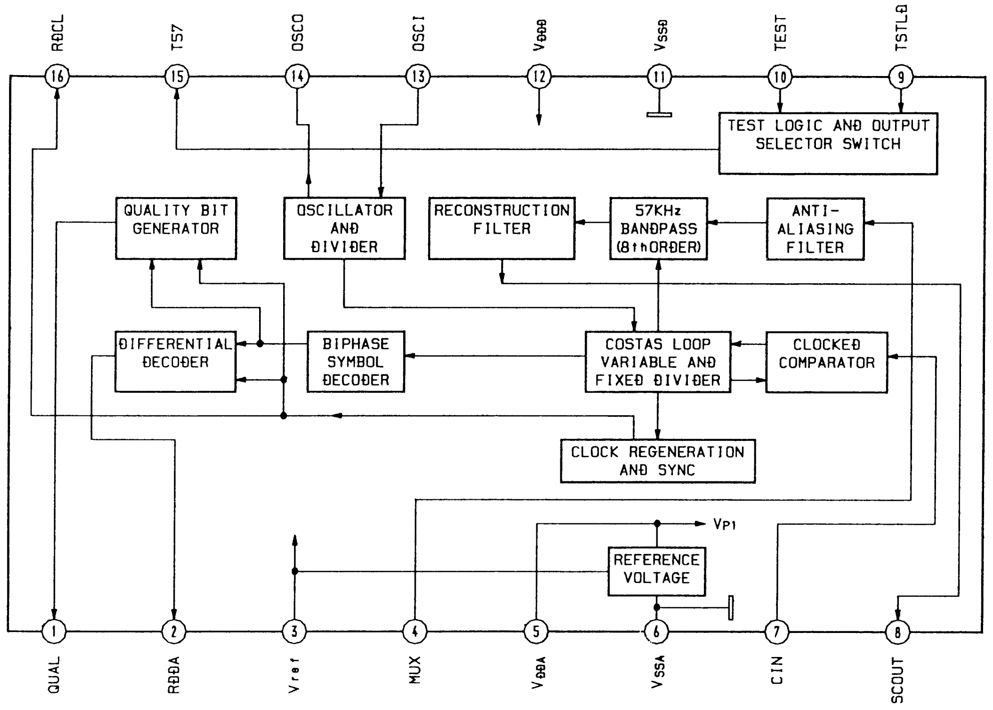
FM-SD
AM-OSC
FM-AFC
AM-RF-IN
AGC
AM.CUT
AM/FM
VCO
MPX-IN
OUT R
OUT L
AMP-IN R
AMP-IN L
R
L
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
ALC
AM OSC
BUFF
AM MIX
AM RF.AMP
AGC
S METER
AM IF
AM DET
LEVEL DET
S-CURVE
AM/FM IF BUFF
COMP
TUNING DRIVE
AM
FM
FM IF
FM DET
REG
GND
DECODER ANTI BIRDIE
STEREO SW
STEREO DRIVE
TRIG
FF
FF
FF
VCO
AM/FM SW
PILOT DET
PHASE DET
VCC
MUTE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
FM-IN
AM-MIX
IF
REG
AM-IF
GND
TU-LED
ST-LED
DET
VCC
IF-BUFF
AM.SD
AM.SD
AM/FM
VCO-STOP

### IC51 LC72130

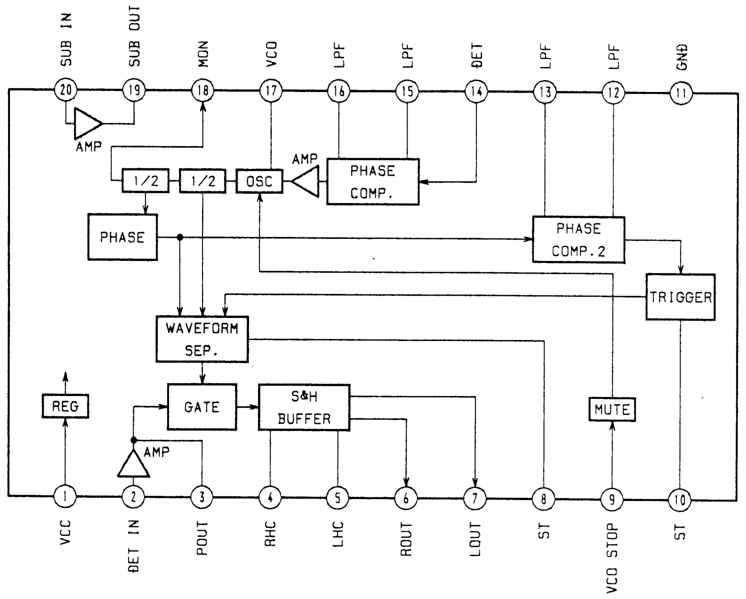


XOUT
VSS
AOUT2
AIN2
PD2
PD1
AIN1
AOUT1
VDD
FMIN
AMIN
IO2
24
23
22
21
20
19
18
17
16
15
14
13
PHASE DETECTOR CHARGE PUMP
UNLOCK DETECTOR
POWER ON RESET
1/2
REFERENCE DIVIDER
SWALLOW COUNTER 1/16, 1/17 4bits
12bits PROGRAMMABLE DRIVER
C²B I/F
DATA SHIFT REGISTER LATCH
UNIVERSAL COUNTER
1
2
3
4
5
6
7
8
9
10
11
12
XIN
BO5
CE
DI
CL
DO
BO1
BO2
BO3
BO4
IO1
IFIN

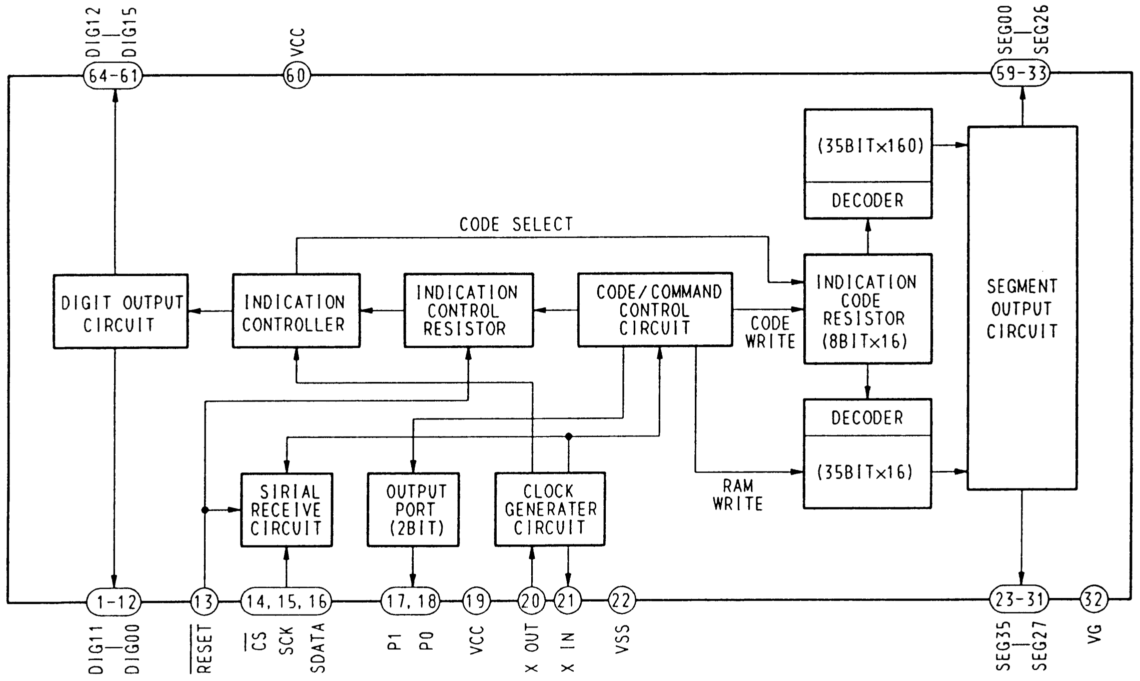
**IC302 SAA6579**


RDCL
T57
OSCO
OSCI
VDDD
VSSD
TEST
TSTLD
16
15
14
13
12
11
10
9
TEST LOGIC AND OUTPUT SELECTOR SWITCH
QUALITY BIT GENERATOR
OSCILLATOR AND DIVIDER
RECONSTRUCTION FILTER
57KHz BANDPASS (8thORDER)
ANTI-ALIASING FILTER
DIFFERENTIAL DECODER
BIPHASE SYMBOL DECODER
COSTAS LOOP VARIABLE AND FIXED DIVIDER
CLOCKED COMPARATOR
CLOCK REGENERATION AND SYNC
VP1
REFERENCE VOLTAGE
1
2
3
4
5
6
7
8
QUAL
RDDA
Vref
MUX
VDDA
VSSA
CIN
SCOUT

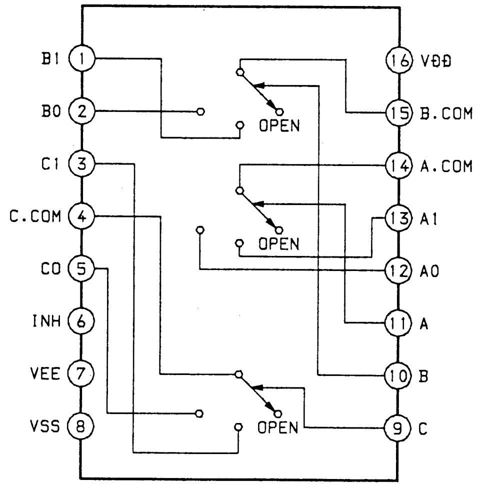
**IC1701 IR3R42**


SUB IN
SUB OUT
MON
VCO
LPF
LPF
DET
LPF
LPF
GND
20
19
18
17
16
15
14
13
12
11
AMP
1/2
1/2
OSC
AMP
PHASE COMP.
PHASE
PHASE COMP.2
TRIGGER
WAVEFORM SEP.
REG
GATE
S&H BUFFER
MUTE
AMP
1
2
3
4
5
6
7
8
9
10
VCC
DET IN
POUT
RHC
LHC
ROUT
LOUT
ST
VCO STOP
ST

**IC601 M66004M6FP**


DIG12—DIG15
VCC
SEG00—SEG26
64-61
60
59-33
(35BITx160)
DECODER
CODE SELECT
DIGIT OUTPUT CIRCUIT
INDICATION CONTROLLER
INDICATION CONTROL RESISTOR
CODE/COMMAND CONTROL CIRCUIT
CODE WRITE
INDICATION CODE RESISTOR (8BITx16)
SEGMENT OUTPUT CIRCUIT
DECODER
(35BITx16)
RAM WRITE
SIRIAL RECEIVE CIRCUIT
OUTPUT PORT (2BIT)
CLOCK GENERATER CIRCUIT
1-12
13
14, 15, 16
17, 18
19
20
21
22
23-31
32
DIG11—DIG00
RESET
CS
SCK
SDATA
P1
P0
VCC
X OUT
X IN
VSS
SEG35—SEG27
VG

**IC1703 MC14053BCP**


B1
1
B0
2
C1
3
C.COM
4
C0
5
INH
6
VEE
7
VSS
8
16
VDD
15
B.COM
14
A.COM
13
A1
12
A0
11
A
10
B
9
C
OPEN
OPEN
OPEN

**Note:**
- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.

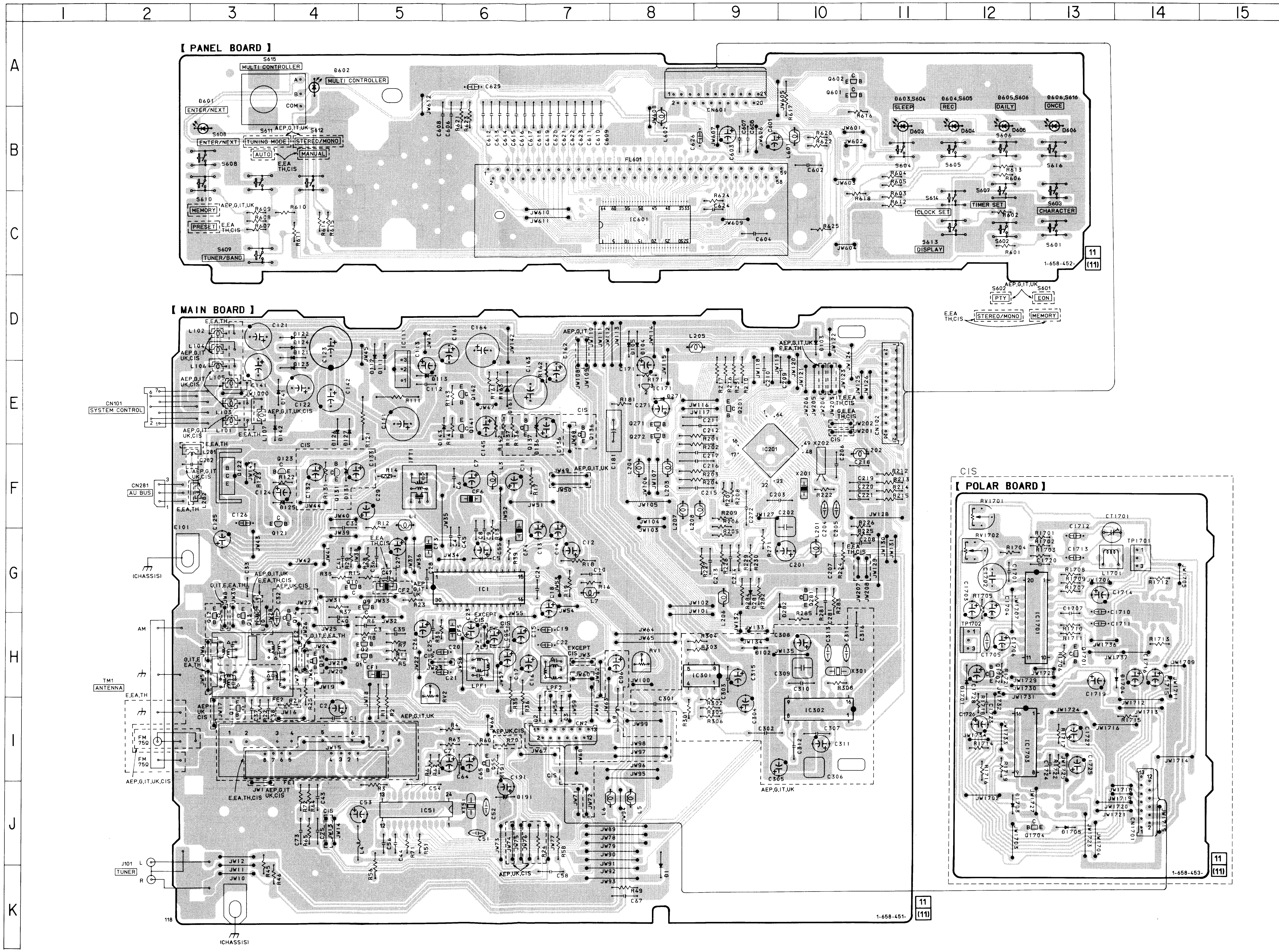
- Abbreviation

G : German model.
IT : Italian model.
EA : Saudi Arabia model.
TH : Thailand model.

## 5-2. PRINTED WIRING BOARD

- **Semiconductor Location**

| Ref. No. | Location | Ref. No. | Location |
|---|---|---|---|
| D1 | K-8 | IC1 | G-6 |
| D2 | I-7 | IC51 | J-5 |
| D3 | I-7 | IC111 | E-5 |
| D102 | H-9 | IC171 | E-8 |
| D103 | D-10 | IC201 | F-9 |
| D104 | D-8 | IC301 | H-9 |
| D105 | D-8 | IC302 | I-10 |
| D111 | D-5 | IC601 | C-8 |
| D112 | D-5 | IC1701 | H-3 |
| D113 | E-5 | IC1703 | I-12 |
| D121 | E-4 | | |
| D122 | D-4 | Q1 | H-5 |
| D123 | E-4 | Q2 | H-5 |
| D124 | D-4 | Q9 | G-5 |
| D125 | F-4 | Q10 | G-4 |
| D126 | E-4 | Q11 | I-3 |
| D127 | E-4 | Q12 | H-3 |
| D131 | F-4 | Q13 | H-3 |
| D136 | E-7 | Q14 | H-4 |
| D141 | E-4 | Q15 | H-4 |
| D142 | E-4 | Q55 | I-6 |
| D143 | E-6 | Q121 | F-4 |
| D161 | E-6 | Q122 | F-3 |
| D191 | J-6 | Q123 | F-4 |
| D271 | E-8 | Q131 | F-4 |
| D281 | G-9 | Q136 | E-7 |
| D282 | G-10 | Q137 | E-7 |
| D601 | B-3 | Q141 | E-6 |
| D602 | A-4 | Q142 | E-6 |
| D603 | B-11 | Q201 | E-9 |
| D604 | B-12 | Q271 | E-8 |
| D605 | B-12 | Q272 | E-8 |
| D606 | B-13 | Q281 | G-10 |
| D1701 | H-12 | Q601 | A-10 |
| D1703 | J-12 | Q602 | A-10 |
| D1704 | H-14 | Q1701 | H-13 |
| D1705 | J-13 | Q1702 | H-12 |
| | | Q1704 | J-13 |


1
2
3
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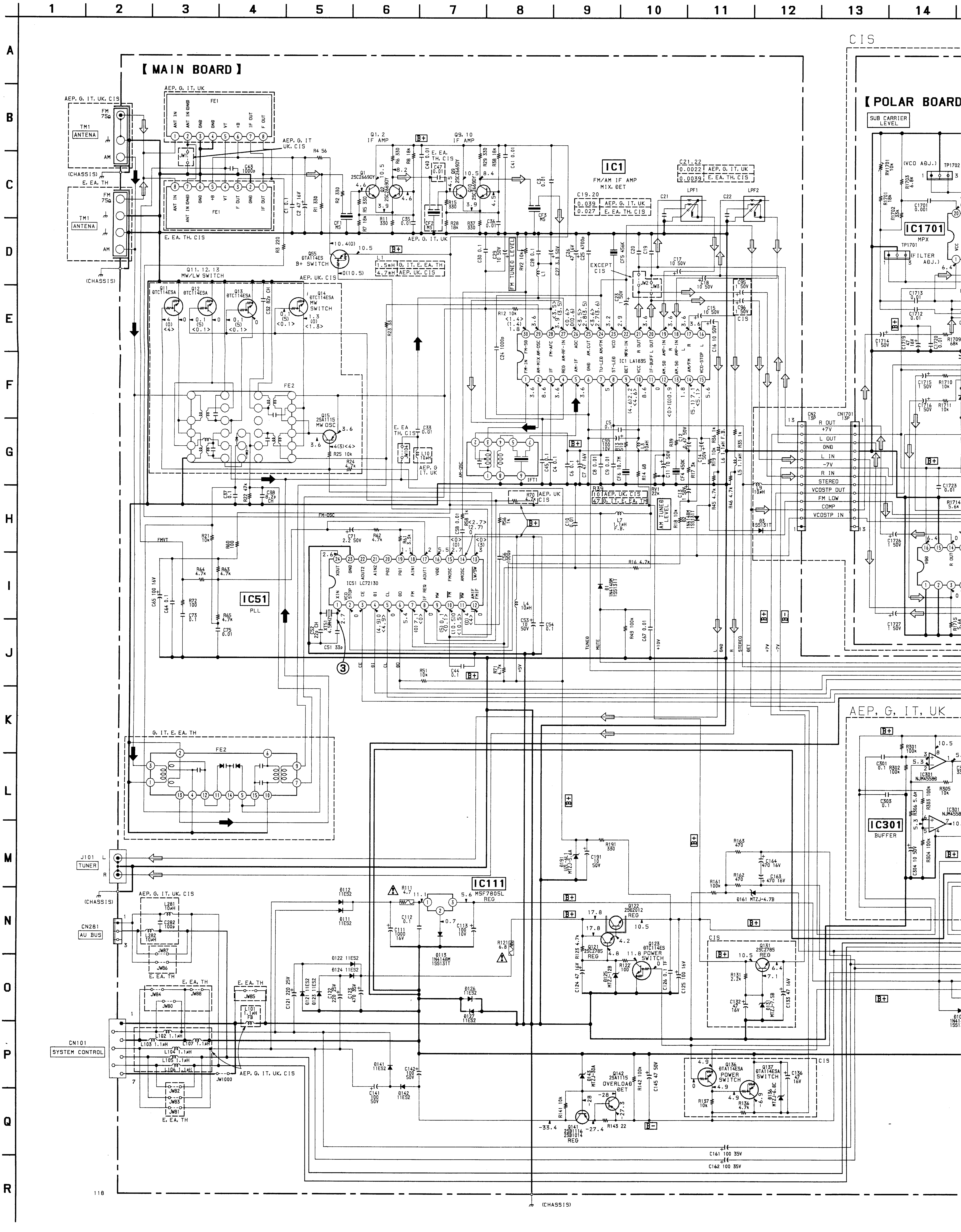
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
K
【 PANEL BOARD 】
MULTI CONTROLLER
ENTER/NEXT
TUNING MODE
STEREO/MONO
AUTO
MANUAL
MEMORY
PRESET
TUNER/BAND
SLEEP
REC
DAILY
ONCE
CLOCK SET
TIMER SET
CHARACTER
DISPLAY
FL601
IC601
1-658-452-
11
(11)
PTY
EON
STEREO/MONO
MEMORY
【 MAIN BOARD 】
CN101
SYSTEM CONTROL
CN281
AU BUS
(CHASSIS)
TM1
ANTENNA
AM
FM 75Ω
J101
TUNER
IC1
IC51
IC201
IC301
IC302
1-658-451-
11
(11)
CIS
【 POLAR BOARD 】
IC1701
IC1703
1-658-453-
11
(11)

MC-Service

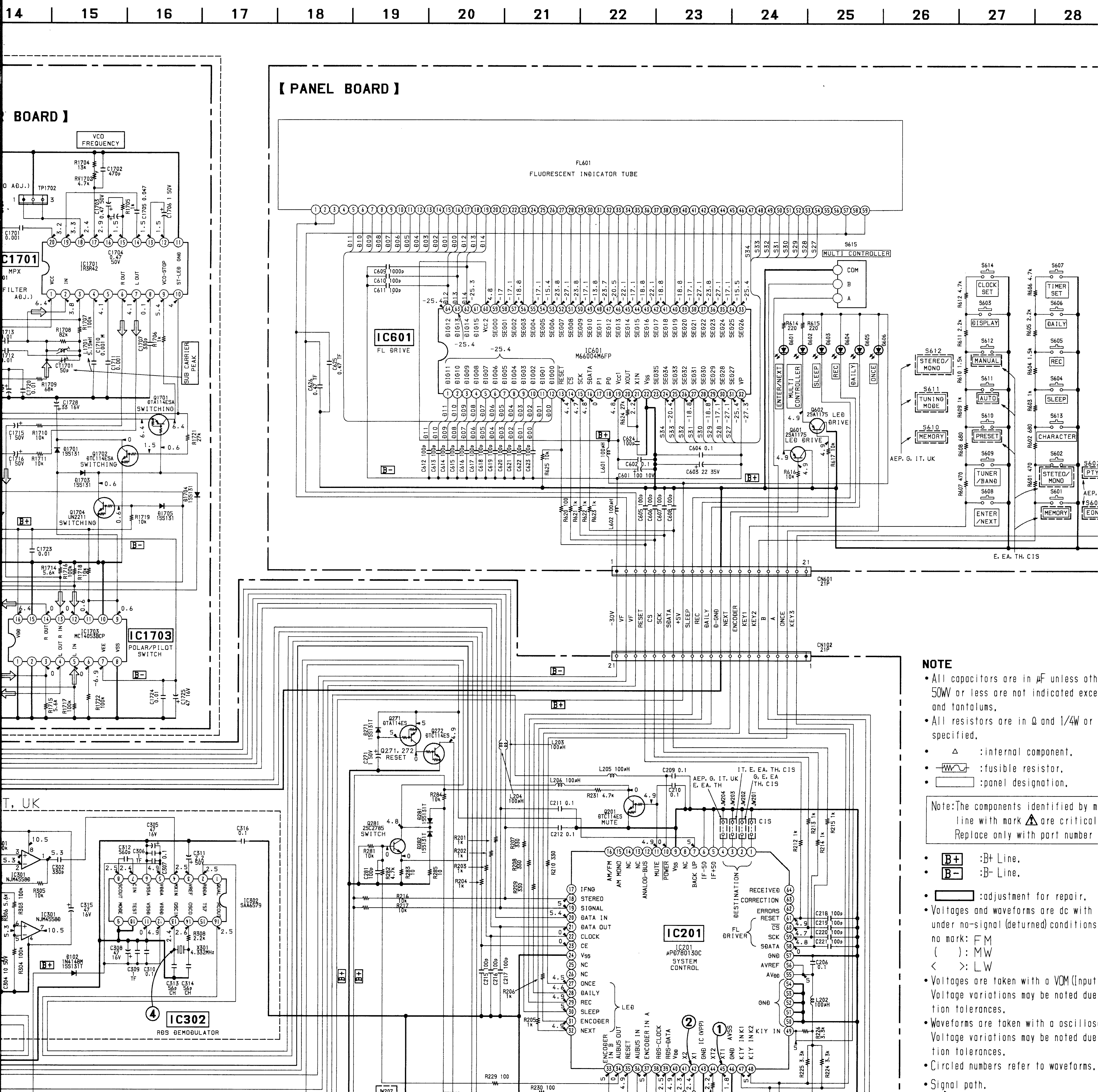
## 5-3. SCHEMATIC DIAGRAM

- See page 8 for IC Block Diagrams.
- See page 17 for IC Pin Function. (IC201)

MC-Service



【MAIN BOARD】
【POLAR BOARD
CIS
AEP, G, IT, UK, CIS
TM1 ANTENNA
FM 75Ω
AM
(CHASSIS)
E, EA, TH
FE1
FE2
Q1, 2 IF AMP
Q9, 10 IF AMP
Q55 DTA114ES B+ SWITCH
Q11, 12, 13 MW/LW SWITCH
Q14 DTC114ESA MW SWITCH
Q15 2SA1115 MW OSC
IC1 FM/AM IF AMP MIX, DET
IC1 LA1835
IC51 PLL
IC51 LC72130
IC1701 MPX
IC301 BUFFER
IC111 M5F7805L REG
Q121 2SC2785 REG
Q122 2SD2012 REG
Q123 DTC114ES POWER SWITCH
Q131 2SC2785 REG
Q136 DTA114ESA POWER SWITCH
Q137 DTA114ESA SWITCH
Q141 2SB1116 2SB1014 REG
Q142 2SA1115 OVERLOAD DET
J101 TUNER
CN281 AU BUS
CN101 SYSTEM CONTROL
CN2 13P
CN1701 13P
+7V
L OUT
GND
L IN
-7V
R IN
STEREO
VCOSTP OUT
FM LOW
COMP
VCOSTP IN
SUB CARRIER LEVEL
VCO ADJ.
FILTER ADJ.
TUNED
MUTE
CE
DI
CL
DO
B+
B-
③
(CHASSIS)


14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
BOARD】
【PANEL BOARD】
FL601
FLUORESCENT INDICATOR TUBE
IC601
FL DRIVE
IC601
M66004M6FP
S615
MULTI CONTROLLER
COM
B
A
Q601
2SA1175 LED DRIVE
Q602
2SA1175 LED DRIVE
ENTER/NEXT
MULTI CONTROLLER
SLEEP
REC
DAILY
ONCE
S612
STEREO/MONO
S611
TUNING MODE
S610
MEMORY
AEP, G, IT, UK
S614
CLOCK SET
S603
DISPLAY
S612
MANUAL
S611
AUTO
S610
PRESET
S609
TUNER /BAND
S608
ENTER /NEXT
S607
TIMER SET
S606
DAILY
S605
REC
S604
SLEEP
S613
CHARACTER
S602
STEREO/ MONO
S601
MEMORY
E, EA, TH, CIS
CN601
21P
CN102
21P
-30V
VF
VF
RESET
CS
SCK
SDATA
+5V
SLEEP
REC
DAILY
D-GND
NEXT
ENCODER
KEY1
KEY2
B
A
ONCE
KEY3
VCO FREQUENCY
IC1701
MPX
IC1701
IR3R42
SUB CARRIER PEAK
Q1701
DTA114ESA SWITCHING
Q1702
DTC114ESA SWITCHING
Q1704
UN2211 SWITCHING
IC1703
MC14053BCP
IC1703
POLAR/PILOT SWITCH
Q271
DTA114ES
Q272
DTC114ES
Q271, 272 RESET
Q281
2SC2785 SWITCH
Q201
DTC114ES MUTE
IC201
IC201
μPD78013OC
SYSTEM CONTROL
IFNG
STEREO
SIGNAL
DATA IN
DATA OUT
CLOCK
CE
Vss
NC
NC
ONCE
DAILY
REC
SLEEP
ENCODER
NEXT
LED
RECEIVED
CORRECTION
ERRORS
RESET
CS
SDATA
GND
AVREF
AVDD
FL DRIVER
DESTINATION
CIS
AEP, G, IT, UK
E, EA, TH
IT, E, EA, TH, CIS
G, E, EA
TH, CIS
X201
10MHz
X202
32.768KHz
T, UK
IC301
NJM4558D
IC302
SAA6579
IC302
RDS DEMODULATOR
IC171
PST600C
IC171
RESET
E, EA
TH, CIS
JW207
JW208
B+
B-
④
②
①

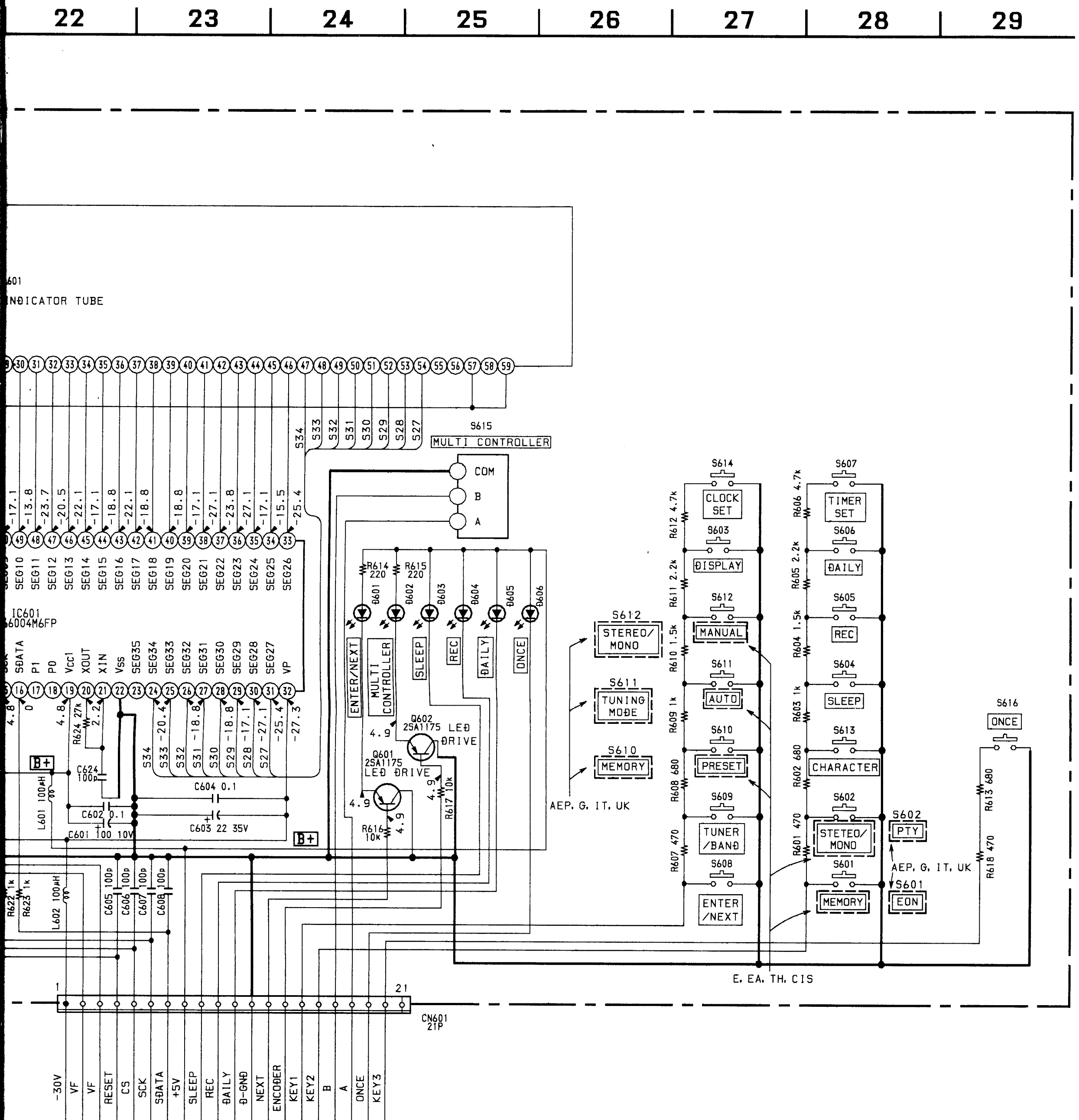
## NOTE

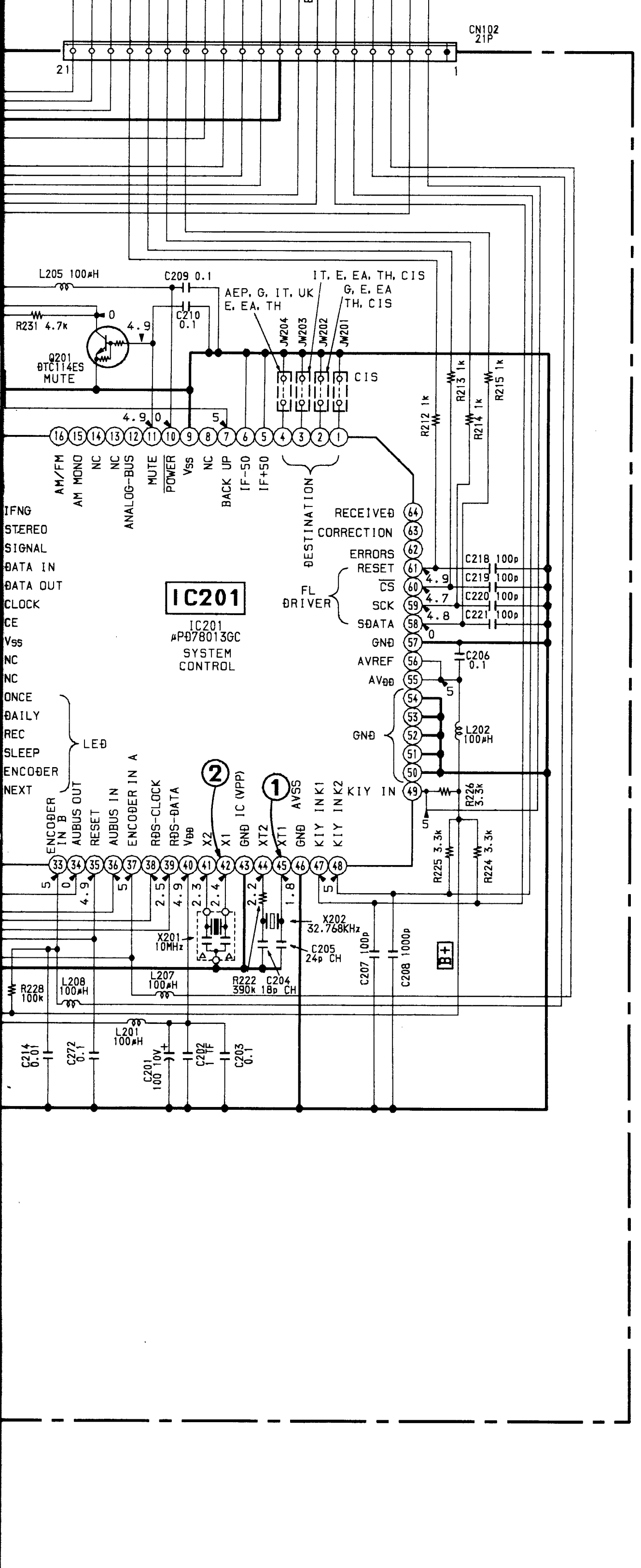
- All capacitors are in μF unless oth
  50WV or less are not indicated exce
  and tantalums.
- All resistors are in Ω and 1/4W or
  specified.
- △ :internal component.
- —⫼∿— :fusible resistor.
- ▭ :panel designation.

Note:The components identified by m
line with mark ⚠ are critical
Replace only with part number

- B+ :B+ Line.
- B- :B- Line.

- ▭ :adjustment for repair.
- Voltages and waveforms are dc with
  under no-signal (deturned) conditions
  no mark: FM
  ( ): MW
  < >: LW
- Voltages are taken with a VOM (Input
  Voltage variations may be noted due
  tion tolerances.
- Waveforms are taken with a oscillos
  Voltage variations may be noted due
  tion tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ➡ :MW
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  TH :Thailand model.


22
23
24
25
26
27
28
29
INDICATOR TUBE
IC601
S615
MULTI CONTROLLER
COM
B
A
S614 CLOCK SET
S603 DISPLAY
S612 MANUAL
S611 AUTO
S610 PRESET
S609 TUNER /BAND
S608 ENTER /NEXT
S607 TIMER SET
S606 DAILY
S605 REC
S604 SLEEP
S613 CHARACTER
S602 STETEO/ MONO
S601 MEMORY
S612 STEREO/ MONO
S611 TUNING MODE
S610 MEMORY
S616 ONCE
S602 PTY
S601 EON
AEP, G, IT, UK
E, EA, TH, CIS
ENTER/NEXT
MULTI CONTROLLER
SLEEP
REC
DAILY
ONCE
Q601 2SA1175 LED DRIVE
Q602 2SA1175 LED DRIVE
B+
CN601 21P
-30V
VF
VF
RESET
CS
SCK
SDATA
+5V
SLEEP
REC
DAILY
D-GND
NEXT
ENCODER
KEY1
KEY2
B
A
ONCE
KEY3


CN102 21P
Q201 DTC114ES MUTE
AEP, G, IT, UK
E, EA, TH
IT, E, EA, TH, CIS
G, E, EA
TH, CIS
CIS
IC201
IC201 μPD78013GC SYSTEM CONTROL
DESTINATION
RECEIVED
CORRECTION
ERRORS
RESET
CS
SCK
SDATA
GND
AVREF
AVDD
FL DRIVER
LED
GND
KIY IN
X201 10MHz
X202 32.768kHz
②
①
B+

## NOTE

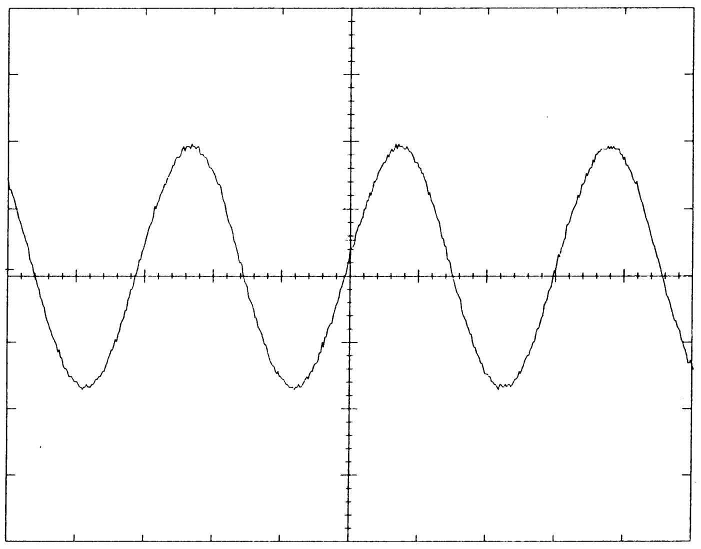
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- —WW— :fusible resistor.
- ▭ :panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

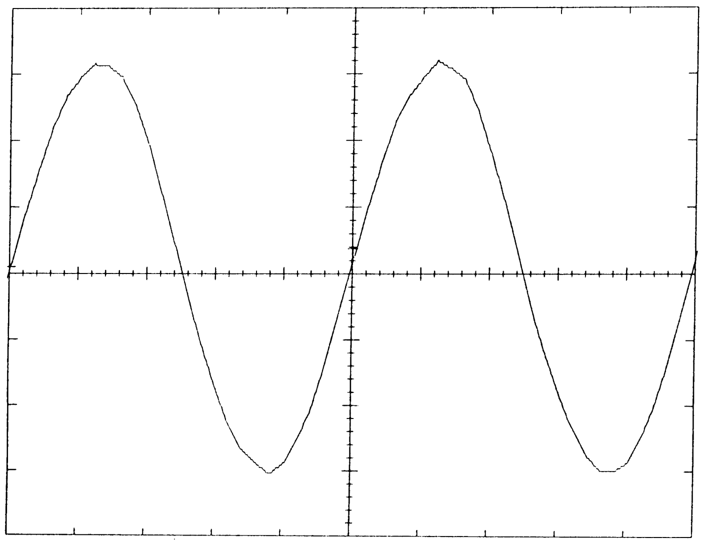
- B+ :B+ Line.
- B- :B- Line.
- ▭ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions.
  no mark: FM
  ( ): MW
  < >: LW
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ➡ :MW
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  TH :Thailand model.

- **Waveforms**

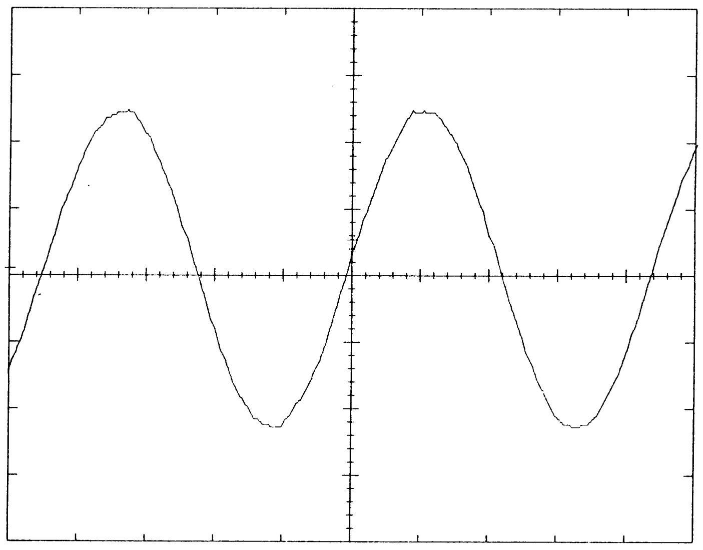
① IC201 ㊺ pin 1.8 Vp-p 32.768 kHz



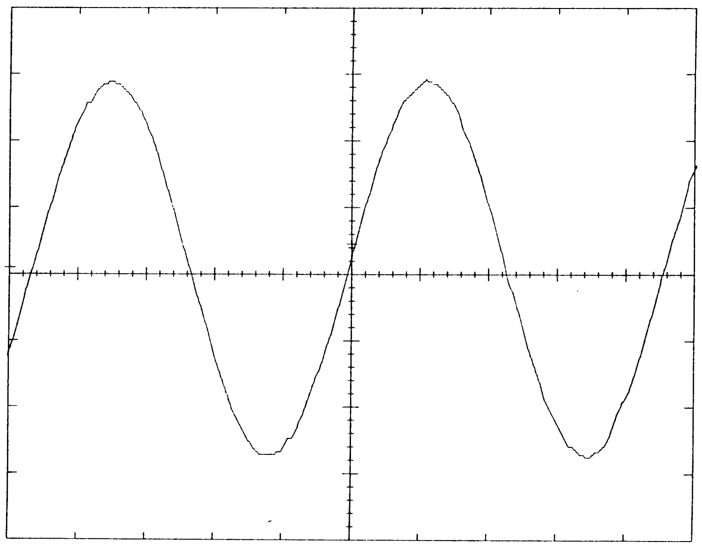
② IC201 ㊷ pin 3.1 Vp-p 10 MHz



③ IC51 ① pin 2.4 Vp-p 4.5 MHz



④ IC302 ⑬ pin 2.8 Vp-p 4.332 MHz



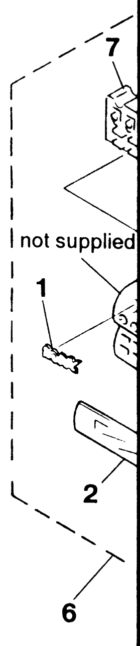
## 5-4. IC PIN FUNCTION

- **IC201 SYSTEM CONTROL ( μPD78013GC)**

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 1 | DESTINATION | I | Destination selection input. |
| 2 | DESTINATION | I | |
| 3 | DESTINATION | I | |
| 4 | DESTINATION | I | |
| 5 | IF +50 | I | Not used. (Ground) |
| 6 | IF –50 | O | |
| 7 | BACK UP | I | Back up mode input. |
| 8 | NC | – | Not used. (open) |
| 9 | Vss | – | Ground |
| 10 | $\overline{\text{POWER}}$ | O | Power ON/OFF switch control. |
| 11 | MUTE | O | Mute output. |
| 12 | ANALOG BUS | – | Not used. (open) |
| 13 | NC | – | |
| 14 | NC | – | |
| 15 | AM MONO | – | |
| 16 | AM/FM | – | |
| 17 | IFNG | – | |
| 18 | STEREO | I | STEREO signal input. |
| 19 | SIGNAL | I | TUNED signal input. |
| 20 | DATA IN | I | Data input. (LC72130, PLL) |
| 21 | DATA OUT | O | Data output. (LC72130, PLL) |
| 22 | CLOCK | O | Clock output. (LC72130, PLL) |
| 23 | CE | O | Chip Enable output. (LC72130, PLL) |
| 24 | Vss | – | Ground |
| 25 | NC | – | Not used. (open) |
| 26 | NC | – | |
| 27 | ONCE | O | LED drive output. |
| 28 | DAILY | O | |
| 29 | REC | O | |
| 30 | SLEEP | O | |
| 31 | ENCODER | O | |
| 32 | NEXT | O | |
| 33 | ENCODER IN B | I | ENCODER input. (B) |
| 34 | AU BUS OUT | O | Audio bus output. |
| 35 | RESET | I | SYSTEM RESET input. |
| 36 | AU BUS IN | I | Audio bus input. |
| 37 | ENCODER IN A | I | ENCODER input. (A) |
| 38 | RDS-CLOCK | I | RDS clock input. |
| 39 | RDS-DATA | I | RDS data input. |
| 40 | VDD | – | Power supply 5V. |

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 41 | X2 | O | System main clock. (10 MHz) |
| 42 | X1 | I | |
| 43 | GND | – | Ground |
| 44 | XT2 | O | System sub clock. (32.768 kHz) |
| 45 | XT1 | I | |
| 46 | GND | – | Ground |
| 47 | KEY IN K1 | I | Key input. (analog) |
| 48 | KEY IN K2 | I | |
| 49 | KEY IN | I | |
| 50 | GND | – | Ground |
| 51 | GND | – | |
| 52 | GND | – | |
| 53 | GND | – | |
| 54 | GND | – | |
| 55 | AVDD | – | Analog power supply +5V. |
| 56 | AVREF | – | Analog system reference voltage input. |
| 57 | GND | – | Ground |
| 58 | SDATA | O | Fluorescent tube data output. (IC601) |
| 59 | SCK | O | Fluorescent tube clock output. (IC601) |
| 60 | $\overline{\text{CS}}$ | O | Fluorescent tube chip select signal output. (IC601) |
| 61 | RESET | O | Fluorescent tube reset signal output. (IC601) |
| 62 | ERRORS | I | Note used. (open) |
| 63 | CORRECTION | O | |
| 64 | RECEIVED | O | |

NOTE:
- Items mark
seldom req
should be a
- Color Indic
KNOB, BA

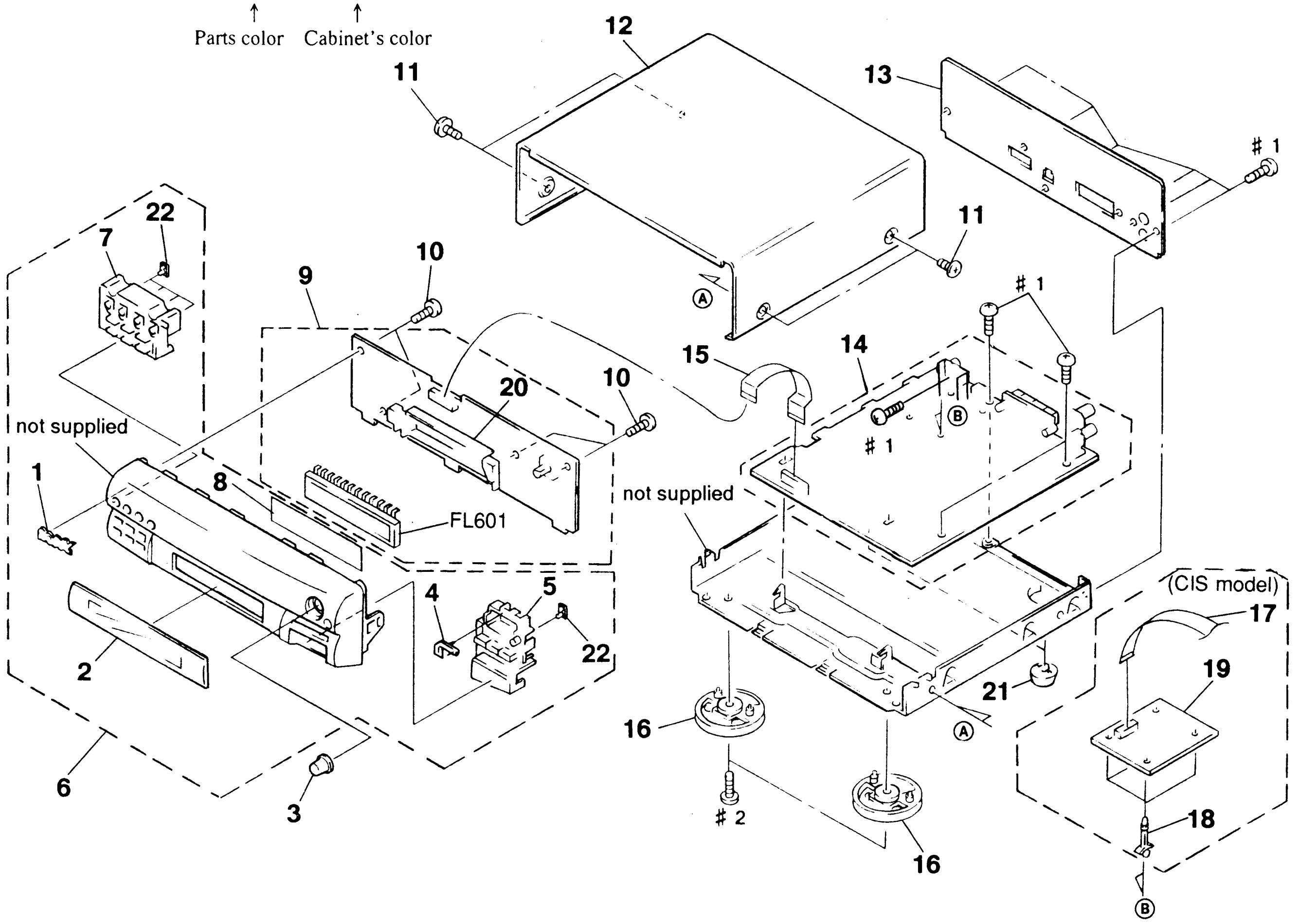


| Ref. No. | Par |
|---|---|
| 1 | 4-9 |
| 2 | X-4 |
| 2 | X-4 |
| 3 | 4-9 |
| 3 | 4-9 |
| 4 | 4-9 |
| 5 | 4-9 |
| 5 | 4-9 |
| 5 | 4-9 |
| 6 | X-4 |
| 6 | X-4 |
| 6 | X-4 |
| 6 | X-4 |
| 7 | 4-9 |
| 7 | 4-9 |
| 8 | 4-9 |
| * 9 | A-4 |
| * 9 | A-4 |
| 10 | 4-9 |

# SECTION 6
# EXPLODED VIEW

NOTE:

- Items marked " ✱ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | 4-962-708-11 | EMBLEM (4-A), SONY | |
| 2 | X-4946-909-1 | WINDOW (FL) ASSY (for SILVER) | |
| 2 | X-4946-912-1 | WINDOW (FL) ASSY (for BLACK) | |
| 3 | 4-977-680-11 | KNOB (JOG) (GRAY)... (SILVER) | |
| 3 | 4-977-680-21 | KNOB (JOG) (BLACK)... (BLACK) | |
| 4 | 4-977-705-11 | INDICATOR (JOG) | |
| 5 | 4-977-704-11 | BUTTON (BAND) (GRAY)... (SILVER) | (AEP, UK, G, IT) |
| 5 | 4-977-704-21 | BUTTON (BAND) (GRAY)... (SILVER) | (E, CIS, EA, TH) |
| 5 | 4-977-704-31 | BUTTON (BAND) (BLACK)... (BLACK) | (AEP, UK, G, IT) |
| 6 | X-4946-594-1 | PANEL ASSY (S), FRONT (SILVER) (E, EA) | |
| 6 | X-4946-834-1 | PANEL ASSY (BP), FRONT (BLACK) | (AEP, UK, G, IT) |
| 6 | X-4946-956-1 | PANEL ASSY (SP), FRONT (SILVER) (CIS, TH) | |
| 6 | X-4946-965-1 | PANEL ASSY (SP), FRONT (SILVER) | (AEP, UK, G, IT) |
| 7 | 4-977-703-11 | BUTTON (TIMER) (GRAY)... (SILVER) | (AEP, UK, G, E, CIS, EA, TH) |
| 7 | 4-977-703-21 | BUTTON (TIMER) (BLACK)... (BLACK) | (AEP, UK, G, IT) |
| 8 | 4-979-353-11 | FILTER (MD) | |
| ✱ 9 | A-4378-851-A | PANEL BOARD, COMPLETE (E, EA, TH) | |
| ✱ 9 | A-4378-864-A | PANEL BOARD, COMPLETE (AEP, UK, G, IT, CIS) | |
| 10 | 4-951-620-01 | SCREW (2.6X8), +BVTP | |
| 11 | 3-363-099-01 | SCREW (CASE 3 TP2) | |
| ✱ 12 | 4-970-927-21 | CASE (BLACK) | |
| ✱ 12 | 4-970-927-41 | CASE (SILVER) | |
| ✱ 13 | 4-978-999-01 | PANEL, BACK (E) | |
| ✱ 13 | 4-978-999-11 | PANEL, BACK (Made in France) | (AEP, UK, G, IT, CIS) |
| ✱ 13 | 4-978-999-21 | PANEL, BACK (Made in Malaysia) (AEP, UK) | |
| ✱ 13 | 4-978-999-31 | PANEL, BACK (EA) | |
| ✱ 13 | 4-978-999-41 | PANEL, BACK (TH) | |
| ✱ 14 | A-4378-850-A | MAIN BOARD, COMPLETE (E, EA, TH) | |
| ✱ 14 | A-4378-863-A | MAIN BOARD, COMPLETE (AEP, UK) | |
| ✱ 14 | A-4378-865-A | MAIN BOARD, COMPLETE (G) | |
| ✱ 14 | A-4389-478-A | MAIN BOARD, COMPLETE (IT) | |
| ✱ 14 | A-4389-479-A | MAIN BOARD, COMPLETE (CIS) | |
| 15 | 1-773-144-11 | WIRE (FLAT TYPE) (21 CORE) | |
| 16 | 4-977-699-11 | LEG (F) | |
| 17 | 1-751-688-11 | WIRE (FLAT TYPE) (13 CORE) (CIS) | |
| 18 | 4-924-098-91 | HOLDER, PC BOARD (CIS) | |
| ✱ 19 | A-4389-480-A | POLAR BOARD, COMPLETE (CIS) | |
| ✱ 20 | 4-979-798-01 | HOLDER (FL) | |
| 21 | 4-965-822-01 | FOOT | |
| 22 | 4-977-674-11 | INDICATOR (ENTER) | |
| FL601 | 1-517-368-11 | INDICATOR TUBE, FLUORESCENT | |

**MAIN**

# SECTION 7
# ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "✱" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB...,
  uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| ✱ | A-4378-863-A | MAIN BOARD, COMPLETE (AEP, UK)<br>✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱ | |
| ✱ | A-4378-850-A | MAIN BOARD, COMPLETE (E, EA, TH)<br>✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱ | |
| ✱ | A-4378-865-A | MAIN BOARD, COMPLETE (G)<br>✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱ | |
| ✱ | A-4389-478-A | MAIN BORAD, COMPLETE (IT)<br>✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱ | |
| ✱ | A-4389-479-A | MAIN BOARD, COMPLETE (CIS)<br>✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱ | |
| | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | |
| | | < CAPACITOR > | |
| C1 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C2 | 1-126-967-11 | ELECT 47uF 20% 16V | |
| C3 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C4 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C5 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C6 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C7 | 1-126-967-11 | ELECT 47uF 20% 16V | |
| C8 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C9 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C10 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C11 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C12 | 1-124-902-00 | ELECT 0.47uF 20% 50V | |
| C13 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C14 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C15 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C16 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C17 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C18 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C19 | 1-136-160-00 | FILM 0.039uF 5% 50V | (AEP, G, IT, UK) |
| C19 | 1-136-158-00 | FILM 0.027uF 5% 50V | (E, EA, TH, CIS) |
| C20 | 1-136-160-00 | FILM 0.039uF 5% 50V | (AEP, G, IT, UK) |
| C20 | 1-136-158-00 | FILM 0.027uF 5% 50V | (E, EA, TH, CIS) |
| C21 | 1-137-389-11 | FILM 0.0022uF 5% 100V | (AEP, G, IT, UK) |
| C21 | 1-137-436-11 | FILM 0.0039uF 5% 50V | (E, EA, TH, CIS) |
| C22 | 1-137-389-11 | FILM 0.0022uF 5% 100V | (AEP, G, IT, UK) |
| C22 | 1-137-436-11 | FILM 0.0039uF 5% 50V | (E, EA, TH, CIS) |
| C23 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C24 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C25 | 1-162-600-11 | CERAMIC 0.0047uF 30% 16V | |
| C26 | 1-126-967-11 | ELECT 47uF 20% 16V | |
| C27 | 1-126-962-11 | ELECT 3.3uF 20% 50V | |
| C28 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C29 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C30 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C32 | 1-102-527-11 | CERAMIC 82PF 5% 50V | (AEP, UK, CIS) |
| C33 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C35 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C36 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C37 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C38 | 1-162-198-31 | CERAMIC 8.2PF 10% 50V | |
| C40 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C41 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C43 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C44 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C45 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C47 | 1-102-129-00 | CERAMIC 0.01uF 10% 50V | (E, EA, TH, CIS) |
| C51 | 1-102-518-11 | CERAMIC 33PF 5% 50V | |
| C52 | 1-102-959-00 | CERAMIC 22PF 5% 50V | |
| C53 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C54 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C55 | 1-126-933-11 | ELECT 100uF 20% 10V | |
| C56 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C58 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C64 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C65 | 1-126-933-11 | ELECT 100uF 20% 16V | |
| C67 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C71 | 1-124-925-11 | ELECT 2.2uF 20% 100V | |
| C73 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C75 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C95 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C96 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | (CIS) |
| C111 | 1-126-952-11 | ELECT | 1000uF | 20% | 16V | |
| C112 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C113 | 1-126-933-11 | ELECT | 100uF | 20% | 10V | |
| C121 | 1-104-666-11 | ELECT | 220uF | 20% | 25V | |
| C122 | 1-104-666-11 | ELECT | 220uF | 20% | 25V | |
| C123 | 1-126-951-11 | ELECT | 470uF | 20% | 35V | |
| C124 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | |
| C125 | 1-126-933-11 | ELECT | 100uF | 20% | 16V | |
| C126 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | |
| C132 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (CIS) |
| C133 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (CIS) |
| C136 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (CIS) |
| C141 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C142 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C145 | 1-126-967-11 | ELECT | 47uF | 20% | 50V | |
| C161 | 1-126-948-11 | ELECT | 100uF | 20% | 35V | |
| C162 | 1-126-948-11 | ELECT | 100uF | 20% | 35V | |
| C163 | 1-126-935-11 | ELECT | 470uF | 20% | 16V | |
| C164 | 1-126-935-11 | ELECT | 470uF | 20% | 16V | |
| C171 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| C181 | 1-125-705-11 | CAPACITOR | 0. 22F | 0 | 5. 5V | |
| C191 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| C201 | 1-126-933-11 | ELECT | 100uF | 20% | 10V | |
| C202 | 1-136-177-00 | FILM | 1uF | 5% | 50V | |
| C203 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C204 | 1-102-953-00 | CERAMIC | 18PF | 5% | 50V | |
| C205 | 1-102-960-00 | CERAMIC | 24PF | 5% | 50V | |
| C206 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C207 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C208 | 1-162-294-31 | CERAMIC | 0. 001uF | 10% | 50V | |
| C209 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C210 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C211 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C212 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C213 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | |
| C214 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | |
| C215 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C216 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C217 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C218 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C219 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C220 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C221 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C271 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | |
| C272 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | |
| C281 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C282 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | (AEP, G, IT, UK, CIS) |
| C301 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | (AEP, G, IT, UK) |
| C302 | 1-162-288-31 | CERAMIC | 330PF | 10% | 50V | (AEP, G, IT, UK) |
| C303 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | (AEP, G, IT, UK) |
| C304 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | (AEP, G, IT, UK) |
| C305 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (AEP, G, IT, UK) |
| C306 | 1-136-177-00 | FILM | 1uF | 5% | 50V | (AEP, G, IT, UK) |
| C307 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | (AEP, G, IT, UK) |
| C308 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (AEP, G, IT, UK) |
| C309 | 1-136-177-00 | FILM | 1uF | 5% | 50V | (AEP, G, IT, UK) |
| C310 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | (AEP, G, IT, UK) |
| C311 | 1-124-925-11 | ELECT | 2. 2uF | 20% | 100V | (AEP, G, IT, UK) |
| C312 | 1-162-291-31 | CERAMIC | 560PF | 10% | 50V | (AEP, G, IT, UK) |
| C313 | 1-101-884-00 | CERAMIC | 56PF | 5% | 50V | (AEP, G, IT, UK) |
| C314 | 1-101-884-00 | CERAMIC | 56PF | 5% | 50V | (AEP, G, IT, UK) |
| C315 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (AEP, G, IT, UK) |
| C316 | 1-164-159-21 | CERAMIC | 0. 1uF | | 50V | (AEP, G, IT, UK) |

< FILTER >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| CF1 | 1-579-374-71 | FILTER, CERAMIC | (AEP, G, IT, UK) |
| CF1 | 1-567-389-11 | FILTER, CERAMIC | (E, EA, TH, CIS) |
| CF2 | 1-760-393-11 | FILTER, CERAMIC | (AEP, G, IT, UK) |
| CF3 | 1-760-393-11 | FILTER, CERAMIC | (AEP, G, IT, UK) |
| CF3 | 1-567-389-11 | FILTER, CERAMIC | (E, EA, TH, CIS) |
| CF4 | 1-527-981-00 | FILTER, CERAMIC | |
| CF5 | 1-577-075-11 | OSCILLATOR, CERAMIC | |
| CF6 | 1-760-220-11 | FILTER, CERAMIC | |

< CONNECTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * CN2 | 1-568-832-11 | SOCKET, CONNECTOR 13P | (CIS) |
| CN101 | 1-770-158-21 | HOUSING, CONNECTOR 7P | (SYSTEM CONTROL) |
| CN102 | 1-568-838-11 | SOCKET, CONNECTOR 21P | |
| * CN281 | 1-565-561-11 | PIN, CONNECTOR 3P | (AU BUS) |

< DIODE >

| Ref. No. | Part No. | Description | | Remark |
|---|---|---|---|---|
| D1 | 8-719-815-85 | DIODE | 1S1585 | |
| D2 | 8-719-815-85 | DIODE | 1S1585 | |
| D3 | 8-719-815-85 | DIODE | 1S1585 | (CIS) |
| D102 | 8-719-815-85 | DIODE | 1S1585 | (AEP, G, IT, UK) |
| D103 | 8-719-815-85 | DIODE | 1S1585 | |

# MAIN

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| D104 | 8-719-815-85 | DIODE 1S1585 | |
| D105 | 8-719-815-85 | DIODE 1S1585 | |
| D111 | 8-719-200-82 | DIODE 11ES2 | |
| D112 | 8-719-200-82 | DIODE 11ES2 | |
| D113 | 8-719-815-85 | DIODE 1S1585 | |
| D121 | 8-719-200-82 | DIODE 11ES2 | |
| D122 | 8-719-200-82 | DIODE 11ES2 | |
| D123 | 8-719-200-82 | DIODE 11ES2 | |
| D124 | 8-719-200-82 | DIODE 11ES2 | |
| D125 | 8-719-110-31 | DIODE RD12ES-B2 | |
| D126 | 8-719-200-82 | DIODE 11ES2 | |
| D127 | 8-719-200-82 | DIODE 11ES2 | |
| D131 | 8-719-921-63 | DIODE MTZJ-7.5B (CIS) | |
| D136 | 8-719-109-97 | DIODE RD6.8ES-B2 (CIS) | |
| D141 | 8-719-200-82 | DIODE 11ES2 | |
| D142 | 8-719-200-82 | DIODE 11ES2 | |
| D143 | 8-719-982-19 | DIODE MTZJ-30A | |
| D161 | 8-719-010-34 | DIODE UZ-4.7BSC | |
| D191 | 8-719-109-88 | DIODE RD5.6ES-B1 | |
| D271 | 8-719-815-85 | DIODE 1S1585 | |
| D281 | 8-719-815-85 | DIODE 1S1585 | |
| D282 | 8-719-815-85 | DIODE 1S1585 | |
| | | < FRONTEND > | |
| FE1 | 1-693-253-21 | FRONT END (4 GANG) (AEP, G, IT, UK) | |
| FE1 | 1-693-090-51 | FRONT END (FM) (2 GANG) (E, EA, TH) | |
| FE1 | 1-693-244-21 | FRONT END (3 GANG) (CIS) | |
| FE2 | 1-233-514-11 | ENCAPSULATED COMPONENT (AEP, UK, CIS) | |
| FE2 | 1-239-634-11 | ENCAPSULATED COMPONENT, AM.RF (G, IT, E, EA, TH) | |
| | | < IC > | |
| IC1 | 8-759-176-03 | IC LA1835 | |
| IC51 | 8-759-288-54 | IC LC72130 | |
| IC111 | 8-759-231-53 | IC TA7805S | |
| IC171 | 8-759-165-80 | IC PST600C-T | |
| IC201 | 8-759-338-81 | IC uPD78013GC-652-AB8 | |
| IC301 | 8-759-634-51 | IC M5218AP (AEP, G, IT, UK) | |
| IC302 | 8-759-169-99 | IC SAA6579 (AEP, G, IT, UK) | |
| | | < IFT > | |
| IFT1 | 1-409-636-11 | TRANSFORMER, IF (CERAMIC FILTER) | |
| | | < JACK > | |
| J101 | 1-770-272-11 | JACK, PIN 2P (TUNER) | |
| | | < COIL > | |
| L1 | 1-407-500-00 | INDUCTOR 4.7mH (AEP, UK, CIS) | |
| L1 | 1-410-688-31 | INDUCTOR 1.5mH (G, IT, E, EA, TH) | |
| L3 | 1-414-183-41 | INDUCTOR 10uH | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| L4 | 1-410-509-11 | INDUCTOR 10uH | |
| L5 | 1-410-397-21 | FERRITE BEAD INDUCTOR | |
| L6 | 1-410-397-21 | FERRITE BEAD INDUCTOR | |
| L7 | 1-410-397-21 | FERRITE BEAD INDUCTOR | |
| L9 | 1-410-509-11 | INDUCTOR 10uH (CIS) | |
| L10 | 1-414-183-41 | INDUCTOR 10uH (AEP, G, IT, UK) | |
| L101 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L102 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L103 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L104 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L105 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L106 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L107 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS) | |
| L201 | 1-414-189-31 | INDUCTOR 100uH | |
| L202 | 1-414-189-31 | INDUCTOR 100uH | |
| L203 | 1-410-521-11 | INDUCTOR 100uH | |
| L204 | 1-410-521-11 | INDUCTOR 100uH | |
| L205 | 1-410-521-11 | INDUCTOR 100uH | |
| L206 | 1-410-521-11 | INDUCTOR 100uH | |
| L207 | 1-410-521-11 | INDUCTOR 100uH | |
| L208 | 1-410-521-11 | INDUCTOR 100uH | |
| L281 | 1-410-509-11 | INDUCTOR 10uH (AEP, G, IT, UK, CIS) | |
| L282 | 1-410-509-11 | INDUCTOR 10uH (AEP, G, IT, UK, CIS) | |
| | | < FILTER > | |
| LPF1 | 1-239-597-11 | FILTER, LOW PASS | |
| LPF2 | 1-239-597-11 | FILTER, LOW PASS | |
| | | < TRANSISTOR > | |
| Q1 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q2 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q9 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q10 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q11 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP, UK, CIS) | |
| Q12 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP, UK, CIS) | |
| Q13 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP, UK, CIS) | |
| Q14 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP, UK, CIS) | |
| Q15 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE (AEP, UK, CIS) | |
| Q55 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP | |
| Q121 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q122 | 8-729-209-15 | TRANSISTOR 2SD2012 | |
| Q123 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP | |
| Q131 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE (CIS) | |
| Q136 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP (CIS) | |
| Q137 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP (CIS) | |
| Q141 | 8-729-118-00 | TRANSISTOR 2SB1116-L | |
| Q142 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| Q201 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP | |
| Q271 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP | |

MC-Service

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| Q272 | 8-729-029-67 | TRANSISTOR | DTC114ESA-TP | | | |
| Q281 | 8-729-119-78 | TRANSISTOR | 2SC2785-HFE | | | |
| | | < RESISTOR > | | | | |
| R1 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R2 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R3 | 1-247-815-91 | CARBON | 220 | 5% | 1/4W | |
| R4 | 1-249-402-11 | CARBON | 56 | 5% | 1/4W | |
| R5 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R6 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R7 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R8 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R11 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R12 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R13 | 1-249-442-11 | CARBON | 510 | 5% | 1/4W | |
| R14 | 1-249-403-11 | CARBON | 68 | 5% | 1/4W | |
| R15 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R16 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R17 | 1-247-842-11 | CARBON | 3K | 5% | 1/4W | |
| R18 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R19 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R21 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R22 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R23 | 1-249-399-11 | CARBON | 33 | 5% | 1/4W | |
| R24 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | (AEP, UK, CIS) |
| R25 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | (AEP, UK, CIS) |
| R28 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R29 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R35 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R36 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R37 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R38 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R39 | 1-249-393-11 | CARBON | 10 | 5% | 1/4W | (AEP, UK, CIS) |
| R39 | 1-249-401-11 | CARBON | 47 | 5% | 1/4W | (G, IT, E, EA, TH) |
| R45 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R46 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R49 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R51 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R56 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R58 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R60 | 1-249-405-11 | CARBON | 100 | 5% | 1/4W | |
| R61 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R62 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R63 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R64 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R65 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R70 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | (AEP, UK, CIS) |
| R71 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R72 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| ⚠R111 | 1-217-641-00 | FUSIBLE | 4.7 | 5% | 1/4W | F |
| ⚠R121 | 1-217-642-81 | FUSIBLE | 6.8 | 5% | 1/4W | F |
| R122 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R123 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R131 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | (CIS) |
| R136 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | (CIS) |
| R137 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | (CIS) |
| R141 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R142 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R143 | 1-247-791-91 | CARBON | 22 | 5% | 1/4W | |
| R161 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R162 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| R163 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| R171 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R181 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R191 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R201 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R202 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R203 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R204 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R205 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R206 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R207 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R208 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R209 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R210 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R212 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R213 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R214 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R215 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R216 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R217 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R222 | 1-247-893-11 | CARBON | 390K | 5% | 1/4W | |
| R224 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R225 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R226 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R227 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R228 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R229 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R230 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R231 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R271 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R281 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R282 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R283 | 1-249-393-11 | CARBON | 10 | 5% | 1/4W | |
| R284 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

## MAIN PANEL

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R285 | 1-249-393-11 | CARBON 10 5% 1/4W | |
| R301 | 1-249-441-11 | CARBON 100K 5% 1/4W | (AEP, G, IT, UK) |
| R302 | 1-249-441-11 | CARBON 100K 5% 1/4W | (AEP, G, IT, UK) |
| R303 | 1-249-441-11 | CARBON 100K 5% 1/4W | (AEP, G, IT, UK) |
| R304 | 1-249-441-11 | CARBON 100K 5% 1/4W | (AEP, G, IT, UK) |
| R305 | 1-249-429-11 | CARBON 10K 5% 1/4W | (AEP, G, IT, UK) |
| R306 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | (AEP, G, IT, UK) |
| R308 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | (AEP, G, IT, UK) |
| | | < VARIABLE RESISTOR > | |
| RV1 | 1-238-601-11 | RES, ADJ, CARBON 22K | |
| RV2 | 1-238-600-11 | RES, ADJ, CARBON 10K | |
| | | < TERMINAL > | |
| TM1 | 1-537-488-11 | TERMINAL BOARD (ANTENNA) | (AEP, G, IT, UK, CIS) |
| TM1 | 1-537-238-21 | TERMINAL BOARD (ANTENNA) | (E, EA, TH) |
| | | < VIBRATOR > | |
| X201 | 1-579-175-11 | VIBRATOR, CERAMIC (10MHz) | |
| X202 | 1-567-098-41 | VIBRATOR, CRYSTAL (32.768KHz) | |
| X301 | 1-579-900-21 | VIBRATOR, CRYSTAL (4.332MHz) | (AEP, G, IT, UK) |
| XT51 | 1-760-549-11 | VIBRATOR, CRYSTAL (4.5MHz) | |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | A-4378-851-A | PANEL BOARD, COMPLETE (E, EA, TH)<br>****************************** | |
| * | A-4378-864-A | PANEL BOARD, COMPLETE (AEP, G, IT, UK, CIS)<br>************************************** | |
| * | 4-979-798-01 | HOLDER (FL) | |
| | | < CAPACITOR > | |
| C601 | 1-126-933-11 | ELECT 100uF 20% 10V | |
| C602 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C603 | 1-104-667-11 | ELECT 22uF 20% 35V | |
| C604 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C605 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C606 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C607 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C608 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C609 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C610 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| C611 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C612 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C613 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C614 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C615 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C616 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C617 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C618 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C619 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C620 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C621 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C622 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C623 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C624 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C625 | 1-136-173-00 | FILM 0.47uF 5% 50V | |
| C626 | 1-136-173-00 | FILM 0.47uF 5% 50V | |
| | | < CONNECTOR > | |
| * CN601 | 1-568-864-11 | SOCKET, CONNECTOR 21P | |
| | | < DIODE > | |
| D601 | 8-719-046-44 | DIODE SEL5221S (ENTER/NEXT) | |
| D602 | 8-719-046-46 | DIODE SEL5221S-TH8F (MULTI CONTROLLER) | |
| D603 | 8-719-046-43 | DIODE SEL5421E-TP15 (SLEEP) | |
| D604 | 8-719-046-44 | DIODE SEL5221S (REC) | |
| D605 | 8-719-046-43 | DIODE SEL5421E-TP15 (DAILY) | |
| D606 | 8-719-046-43 | DIODE SEL5421E-TP15 (ONCE) | |
| | | < FLUORESCENT INDICATOR > | |
| FL601 | 1-517-368-11 | INDICATOR TUBE, FLUORESCENT | |
| | | < IC > | |
| IC601 | 8-759-261-63 | IC M66004M6FP | |
| | | < COIL > | |
| L601 | 1-414-189-31 | INDUCTOR 100uH | |
| L602 | 1-414-189-31 | INDUCTOR 100uH | |
| | | < TRANSISTOR > | |
| Q601 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| Q602 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| | | < RESISTOR > | |
| R601 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R602 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R603 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R604 | 1-249-419-11 | CARBON 1.5K 5% 1/4W | |
| R605 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R606 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R607 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R608 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R609 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R610 | 1-249-419-11 | CARBON 1.5K 5% 1/4W | |
| R611 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R612 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R613 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R614 | 1-247-815-91 | CARBON 220 5% 1/4W | |
| R615 | 1-247-815-91 | CARBON 220 5% 1/4W | |
| R616 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R617 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R618 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R620 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R621 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R622 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R623 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R624 | 1-249-434-11 | CARBON 27K 5% 1/4W | |
| R625 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| | | < SWITCH > | |
| S601 | 1-554-303-21 | SWITCH, TACTILE (AEP,G,IT,UK:EON)<br>(E,EA,TH,CIS:MEMORY) | |
| S602 | 1-554-303-21 | SWITCH, TACTILE (AEP,G,IT,UK:PTY)<br>(E,EA,TH,CIS:STEREO/MONO) | |
| S603 | 1-554-303-21 | SWITCH, TACTILE (DISPLAY) | |
| S604 | 1-554-303-21 | SWITCH, TACTILE (SLEEP) | |
| S605 | 1-554-303-21 | SWITCH, TACTILE (REC) | |
| S606 | 1-554-303-21 | SWITCH, TACTILE (DAILY) | |
| S607 | 1-554-303-21 | SWITCH, TACTILE (TIMER SET) | |
| S608 | 1-554-303-21 | SWITCH, TACTILE (ENTER/NEXT) | |
| S609 | 1-554-303-21 | SWITCH, TACTILE (TUNER/BAND) | |
| S610 | 1-554-303-21 | SWITCH, TACTILE (AEP,G,IT,UK:MEMORY)<br>(E,EA,TH,CIS:PRESET) | |
| S611 | 1-554-303-21 | SWITCH, TACTILE (E,EA,TH,CIS:AUTO)<br>(AEP,G,IT,UK:TUNING MODE) | |
| S612 | 1-554-303-21 | SWITCH, TACTILE (E,EA,TH,CIS:MANUAL)<br>(AEP,G,IT,UK:STEREO/MONO) | |
| S613 | 1-554-303-21 | SWITCH, TACTILE (CHARACTER) | |
| S614 | 1-554-303-21 | SWITCH, TACTILE (CLOCK SET) | |
| S615 | 1-473-403-11 | ENCODER, ROTARY (MULTI CONTROLLER) | |
| S616 | 1-554-303-21 | SWITCH, TACTILE (ONCE) | |

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* A-4389-480-A POLAR BOARD, COMPLETE (CIS)

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< CAPACITOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| C1701 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | (CIS) |
| C1702 | 1-130-014-00 | FILM 470PF 5% 50V | (CIS) |
| C1703 | 1-124-902-00 | ELECT 0.47uF 20% 50V | (CIS) |
| C1704 | 1-124-902-00 | ELECT 0.47uF 20% 50V | (CIS) |
| C1705 | 1-101-006-00 | CERAMIC 0.047uF 50V | (CIS) |
| C1706 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1707 | 1-162-288-31 | CERAMIC 330PF 10% 50V | (CIS) |
| C1710 | 1-137-364-11 | FILM 0.001uF 5% 50V | (CIS) |
| C1711 | 1-137-364-11 | FILM 0.001uF 5% 50V | (CIS) |
| C1712 | 1-130-736-11 | FILM 0.01uF 5% 50V | (CIS) |
| C1713 | 1-130-736-11 | FILM 0.01uF 5% 50V | (CIS) |
| C1714 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1715 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1716 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1719 | 1-126-967-11 | ELECT 47uF 20% 16V | (CIS) |
| C1720 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | (CIS) |
| C1723 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | (CIS) |
| C1724 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | (CIS) |
| C1725 | 1-126-967-11 | ELECT 47uF 20% 16V | (CIS) |
| C1726 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1727 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1728 | 1-126-966-11 | ELECT 33uF 20% 16V | (CIS) |
| | | < CONNECTOR > | |
| * CN1701 | 1-568-832-11 | SOCKET, CONNECTOR 13P | (CIS) |
| | | < TRIMMER > | |
| CT1701 | 1-141-260-00 | CAP, TRIMMER 50PF | (CIS) |
| | | < DIODE > | |
| D1701 | 8-719-815-85 | DIODE 1S1585 | (CIS) |
| D1703 | 8-719-815-85 | DIODE 1S1585 | (CIS) |
| D1704 | 8-719-815-85 | DIODE 1S1585 | (CIS) |
| D1705 | 8-719-815-85 | DIODE 1S1585 | (CIS) |
| | | < IC > | |
| IC1701 | 8-759-063-04 | IC IR3R42 | (CIS) |
| IC1703 | 8-759-140-53 | IC uPD4053BC | (CIS) |
| | | < COIL > | |
| L1701 | 1-409-497-11 | COIL (FILTER) | (CIS) |
| | | < TRANSISTOR > | |
| Q1701 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP | (CIS) |
| Q1702 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP | (CIS) |
| Q1704 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP | (CIS) |
| | | < RESISTOR > | |
| R1701 | 1-249-432-11 | CARBON 18K 5% 1/4W | (CIS) |
| R1702 | 1-249-435-11 | CARBON 33K 5% 1/4W | (CIS) |
| R1703 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | (CIS) |
| R1704 | 1-247-858-11 | CARBON 13K 5% 1/4W | (CIS) |

MC-Service

## POLAR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| R1705 | 1-249-417-11 | CARBON 1K 5% 1/4W | (CIS) |
| R1706 | 1-249-417-11 | CARBON 1K 5% 1/4W | (CIS) |
| R1707 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
| R1708 | 1-249-440-11 | CARBON 82K 5% 1/4W | (CIS) |
| R1709 | 1-249-439-11 | CARBON 68K 5% 1/4W | (CIS) |
| R1710 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1711 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1714 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | (CIS) |
| R1715 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | (CIS) |
| R1716 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
| R1717 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
| R1718 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1719 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1721 | 1-249-434-11 | CARBON 27K 5% 1/4W | (CIS) |
| R1722 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
|  |  | < VARIABLE RESISTOR > |  |
| RV1701 | 1-238-600-11 | RES, ADJ, CARBON 10K (CIS) |  |
| RV1702 | 1-238-599-11 | RES, ADJ, CARBON 4.7K (CIS) |  |
|  |  | < TEST PIN > |  |
| * TP1701 | 1-560-061-00 | PIN, CONNECTOR 3P (CIS) |  |
| * TP1702 | 1-560-061-00 | PIN, CONNECTOR 3P (CIS) |  |

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MISCELLANEOUS
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| Ref.No. | Part No. | Description |
|---|---|---|
| 15 | 1-773-144-11 | WIRE (FLAT TYPE)(21 CORE) |
| 17 | 1-751-688-11 | WIRE (FLAT TYPE)(13 CORE)(CIS) |
| FL601 | 1-517-368-11 | INDICATOR TUBE, FLUORESCENT |

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ACCESSORIES & PACKING MATERIALS
*******************************

| Ref.No. | Part No. | Description |
|---|---|---|
| * | 4-980-539-01 | CUSHION (UPPER) |
| * | 4-980-540-01 | CUSHION (LOWER) |

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******************
HARDWARE LIST
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| Ref.No. | Part No. | Description |
|---|---|---|
| #1 | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S |
| #2 | 7-685-647-79 | SCREW +BVTP 3X10 TYPE2 N-S |

**English**
96B0978-1
Printed in Japan
© 1996. 2
**Published by Home A&V Products Div.**
**Quality Engineering Dept.**

**Sony Corporation**
**Consumer A&V Products Company**
**Home A&V Products Div.**

**9-960-499-11**

# CDP-EX100

# SERVICE MANUAL

*AEP Model*
*UK Model*
*E Model*

This set is the CD player section in
MHC-EX50/EX70AV/EX100AV.

| | |
|---|---|
| Model Name Using Similar Mechanism | CDP-EX10 |
| CD Mechanism Type | CDM28-5BD19 |
| Base Unit Name | BU-5BD19 |

## SPECIFICATIONS

**CD player**

| | |
|---|---|
| System | Compact disc and digital audio system |
| Laser | Semiconductor laser (λ=780 nm)<br>Emission duration: continuous |
| Laser output | Max 44.6 μW*<br>* This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture. |
| Wavelength | 780 – 790 nm |
| Frequence response | 2 Hz – 20 kHz (±0.5 dB) |
| Signal-to-noise ratio | More than 105 dB |
| Dynamic range | More than 95 dB |

Outputs

CD OUT (phono jacks):
Output level 2 V
(at 50 kilohms)
Load impedance over
10 kilohms

CD DIGITAL OPTICAL OUT
(Square optical connector jack, rear panel):
wave length 660 nm
output level –18 dBm

Dimensions
Approx. 280 x 82.5 x 280 mm
(11 1/8 x 3 1/4 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls

Mass Approx. 2.1 kg
(4 lb 10 oz)

Design and specifications are subject to change without notice.

MICROFILM

## COMPACT DISC PLAYER

SONY®

The laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

The following caution label is located inside of the unit.

| | | |
|---|---|---|
| CAUTION | ; | INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM. |
| ADVARSEL | ; | USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDS ÆTTELSE FOR STRÅLING. |
| VARO! | ; | AVATTAESSA JA SUOJALUKITUS OHITETTAESSA DLET ALTTIINA LASERSÄTEILYLLE. |
| VARNING | ; | LASERSTRÅLING NÄR DENNA DEL ÄR OPPNÅD OCH SPÄRREN ÄR URXOPPLAD. |
| ADVARSEL | ; | USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN. |

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

**CAUTION**

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

### Notes on Chip Component Replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

### NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

### NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

**SAFETY-RELATED COMPONENT WARNING!!**

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

## TABLE OF CONTENTS

**1. SERVICE NOTE** ........ 3

**2. GENERAL** ........ 4

**3. DISASSEMBLY**
3-1. Loading Panel ........ 4
3-2. MD Block ........ 5
3-3. Holder (BU) Assy ........ 5

**4. ELECTRICAL ADJUSTMENTS** ........ 6

**5. DIAGRAMS**
5-1. IC Pin Function ........ 8
5-2. Circuit Boards Location ........ 10
5-3. Printed Wiring Board – BD Section – ........ 11
5-4. Schematic Diagram – BD Section – ........ 13
5-5. Printed Wiring Boards – Main Section – ........ 16
5-6. Schematic Diagram – Main Section – ........ 19

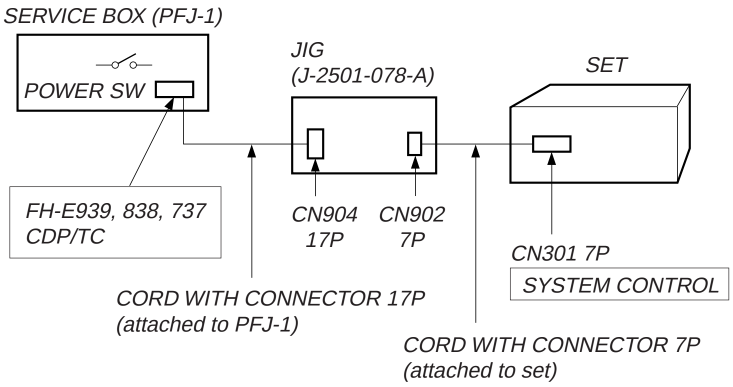
**6. EXPLODED VIEWS**
6-1. Chassis Section ........ 26
6-2. Front Panel Section ........ 27
6-3. CD Mechanism Section ........ 28
6-4. Base Unit Section ........ 29

**7. ELECTRICAL PARTS LIST** ........ 30

# SECTION 1
# SERVICE NOTE

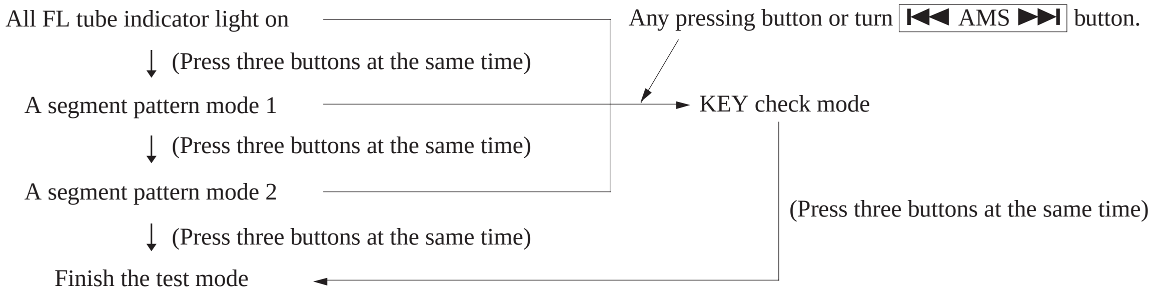
- **How to operate with a single unit**

  Normally this set does not operate with a single unit.
  When you must be mending, connect to other unit.
  If the SYSTEM POWER switch of the amplifire is set to ON, the power supply of the set is turned on.
  In case of other unit is nothing, the service box (PFJ-1) and exclusive jig (J-2501-078-A) are necessary to operate the set with a single unit.
  In case of above mentioned, press the ■ button and TIME button at the same time, to enter the power on.


SERVICE BOX (PFJ-1)
POWER SW
JIG
(J-2501-078-A)
SET
FH-E939, 838, 737
CDP/TC
CN904
17P
CN902
7P
CN301 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

- **FL tube/ KEY check mode**

  After to enter the power on, when ■ button, TIME button and ▶▶ button are pressed at the same time, you will be check FL tube.
  Whenever press the above mentioned three buttons at the same time, change to check mode of FL tube.
  Under check mode of FL tube when any pressing button or turn |◀◀ AMS ▶▶| button, change to KEY check mode.
  To finish KEY check mode, press the above mentioned three buttons at the same time.


All FL tube indicator light on
(Press three buttons at the same time)
A segment pattern mode 1
(Press three buttons at the same time)
A segment pattern mode 2
(Press three buttons at the same time)
Finish the test mode
Any pressing button or turn |◀◀ AMS ▶▶| button.
KEY check mode
(Press three buttons at the same time)

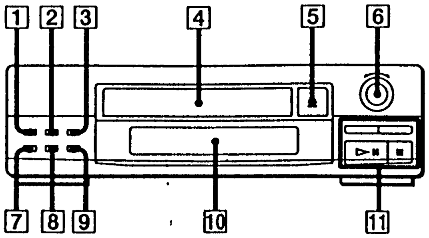
**Note 1)**
All FL tube light on mode is kept when three buttons which is pressed to enter all FL tube light on mode, release at the same time. If you will be release failure them, it is moved to KEY check mode after all FL tube light on mode.

**Note 2)**
Under KEY check mode, every time and button pressed or |◀◀ AMS ▶▶| button turned on, figure on “ KEY= ” of FL tube is increased.

# SECTION 2
# GENERAL

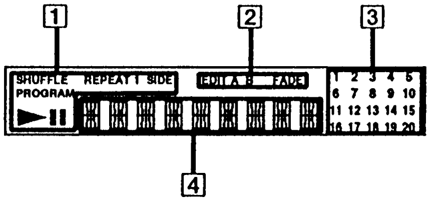
This section is extracted from instruction manual.

### Front Panel


1
2
3
4
5
6
7
8
9
10
11

1 PLAY MODE button (8, 15)
2 REPEAT button (9)
3 TIME button (7)
4 Disc tray (7)
5 ⏏ OPEN/CLOSE button (open/close of the disc tray) (7, 13)
6 |◀◀ AMS ▶▶| control (8, 15)
7 EDIT button (14, 15)
8 CHECK button (9, 15)
9 CLEAR button (9)
10 Display window (7, 14, 15)
11 CD player operating buttons
◀◀/▶▶ (manual search) (8)
▷II (play/pause) (7, 14)
■ (stop) (7, 13)

### Display Window

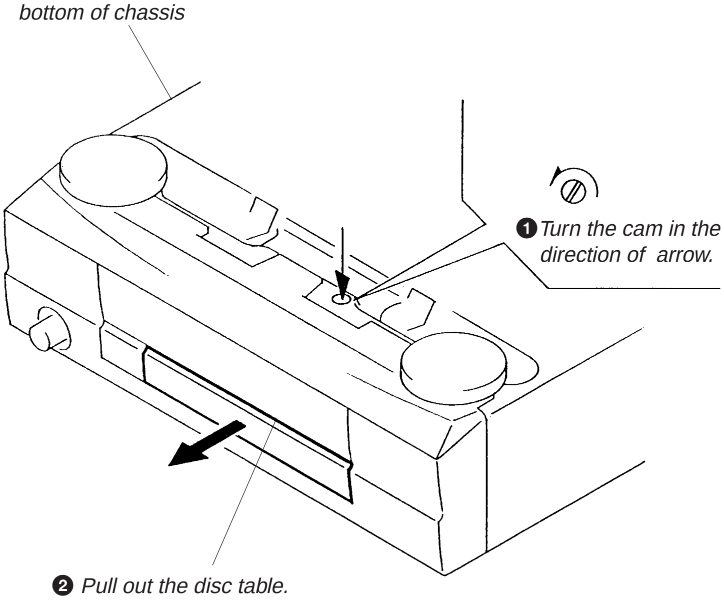

1
2
3
SHUFFLE
REPEAT 1 SIDE
PROGRAM
EDIT A B
FADE
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
4

1 CD play mode indication (7)
2 CD edit mode indication (14)
3 Music calendar (7, 14)
4 Step/track number/playing time indication (7, 9, 14)

# SECTION 3
# DISASSEMBLY

**Note :** Follow the disassembly procedure in the numerical order given.

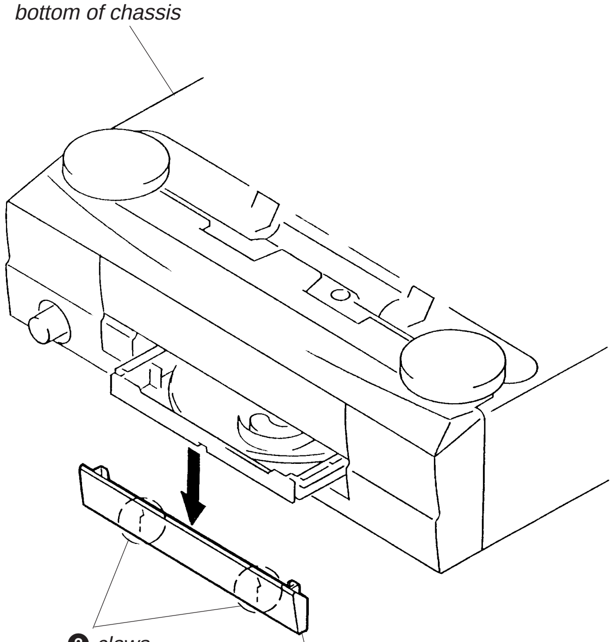
## 3-1. LOADING PANEL



*bottom of chassis*

❶ *Turn the cam in the direction of arrow.*

❷ *Pull out the disc table.*

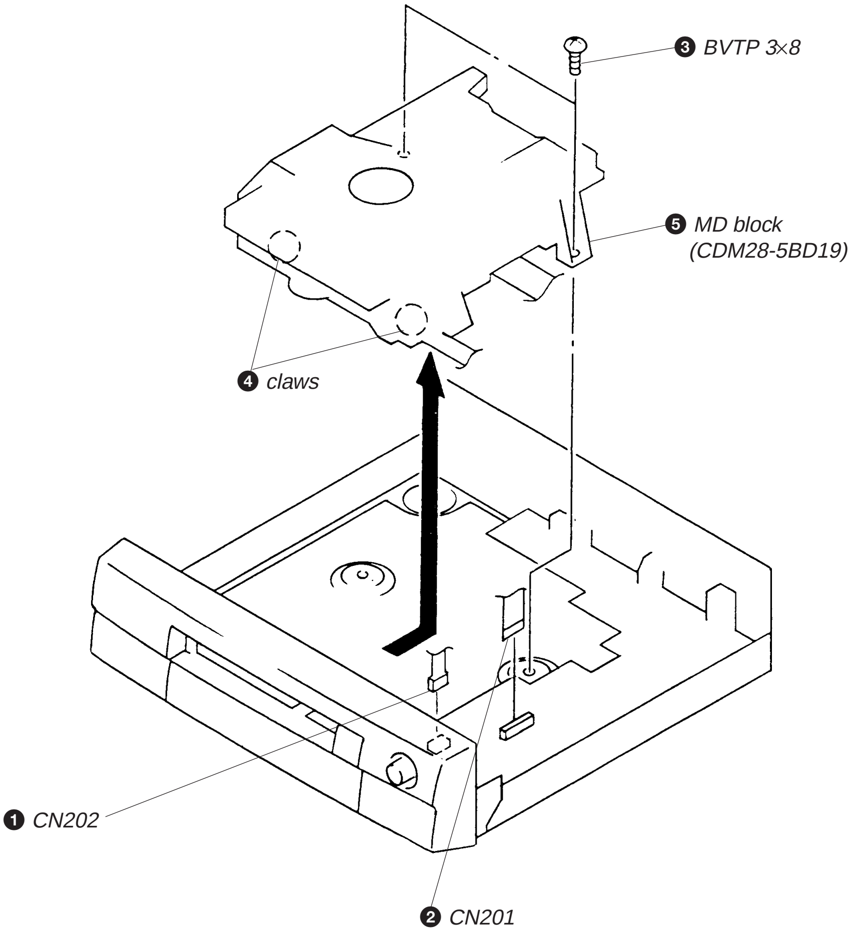


*bottom of chassis*

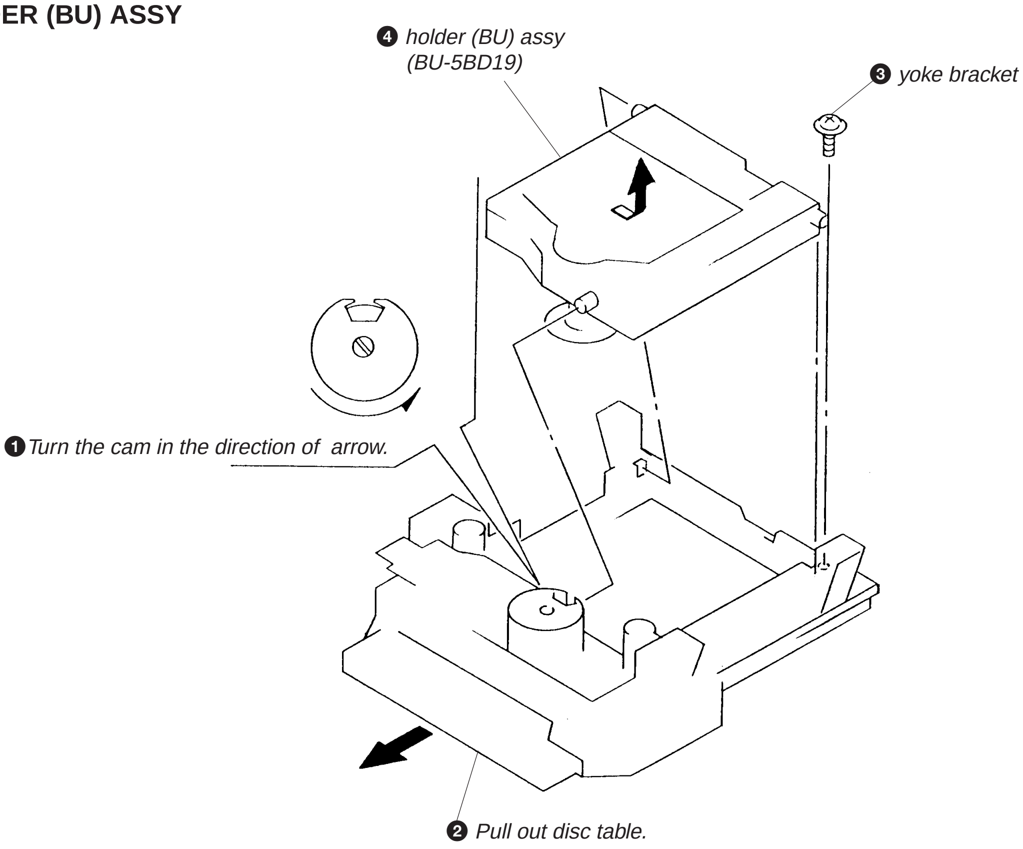
❸ *claws*

❹ *Remove the loading panel in the direction of arrow.*

### 3-2. MD BLOCK


❸ BVTP 3×8
❺ MD block (CDM28-5BD19)
❹ claws
❶ CN202
❷ CN201

### 3-3. HOLDER (BU) ASSY

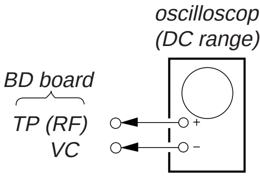

❹ holder (BU) assy (BU-5BD19)
❸ yoke bracket
❶ Turn the cam in the direction of arrow.
❷ Pull out disc table.

# SECTION 4
# ELECTRICAL ADJUSTMENTS

**Note :**

1. Basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than 10MΩ impedance.
4. Clean the objective lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.
5. Adjust the focus bias adjustment when optical block is replaced.

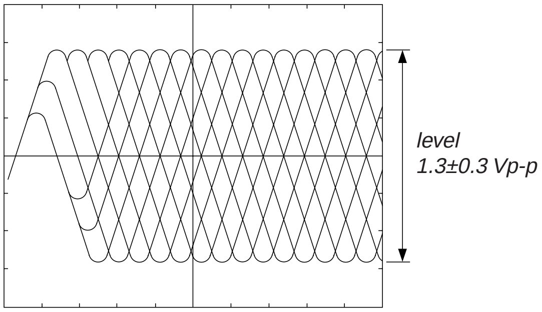
### Focus Bias Adjustment



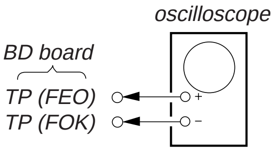
**Procedure:**

1. Connect oscilloscope to test point TP (RF). (GND terminal : VC)
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Adjust RV101 so that the waveform is clear.
   (Clear RF signal waveform means that the shape “ ◇ ” can be clearly distinguished at the center of the waveform.)
5. After adjustment, check the RF signal level.

- RF signal
  VOLT/DIV : 200 mV
  TIME/DIV : 500 nS



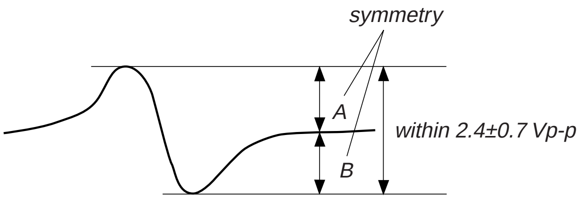
### S Curve Check



**Procedure:**

1. Connect oscilloscope to test point TP(FEO).
2. Connect between test point TP(FOK)and GND by lead wire.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and turnd Power switch on again and actuate the focus search. (In case of using SERVICE BOX actuate the focus search when disc table is moving in and out.)
5. Check the oscillosope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 2.4±0.7 Vp-p.

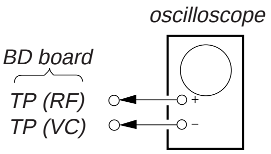
*S-curve waveform*



6. After check, remove the lead wire connected in step 2.

**Note :** • Try to measure several times to make sure than the ratio of A:B or B:A is more than 10:7.
• Take sweep time as long as possible and light up the brightness to obtain best waveform.

### RF Level Check



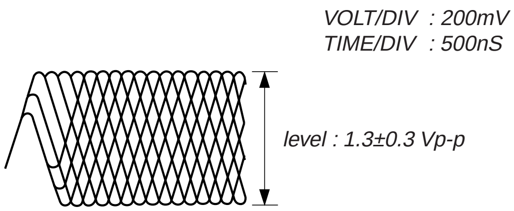
**Procedure:**

1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

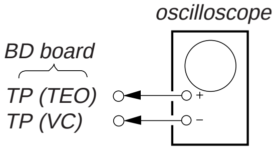
**Note :**

Clear RF signal waveform means that the shape “ ◇ ” can be clearly distinguished at the center of the waveform.

*RF signal waveform*



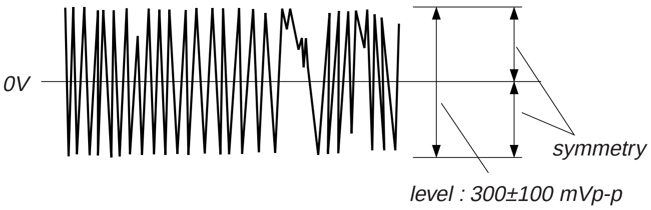
### E-F Balance Check


oscilloscope
BD board
TP (TEO)
TP (VC)
+
–

**Procedure:**

1. Connect oscilloscpe to test point TP (TEO).
2. Turn Power switch on.
3. Connect pin ㉔ of IC60I on the PANEL board to GND with a lead wire.
4. Put disc (YEDS-18) in and playback.
5. Push TIME button.
6. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0Vdc, and check this level.

*Traverse waveform*



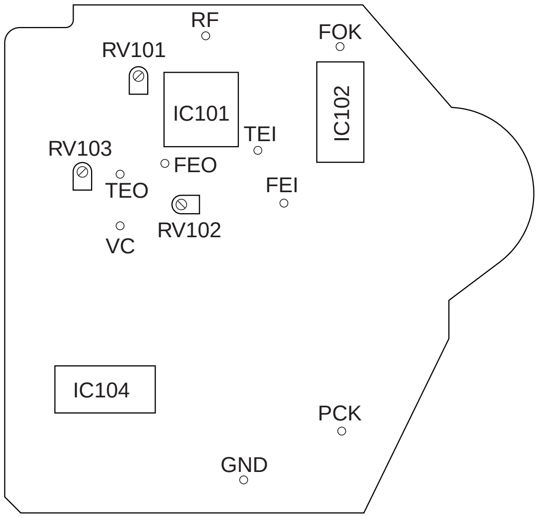
7.Remove the lead wire connected in step 3.

### Focus/Tracking Gain Adjustment (RV102, 103)

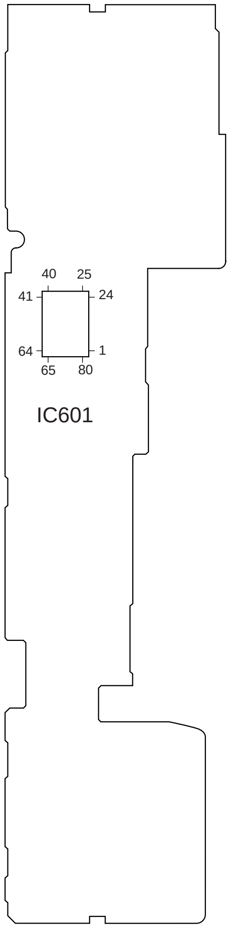
This gain has a margin, so even if it is slightly off.
There is no problem.
Therefore, do not perform this adjustment.
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

### Adjustment Location :

**[BD BOARD]** (Conductor Side)


RF
FOK
RV101
IC101
IC102
RV103
TEI
FEO
TEO
FEI
RV102
VC
IC104
PCK
GND

**[PANEL BOARD]** (Conductor Side)


40
25
41
24
64
1
65
80
IC601

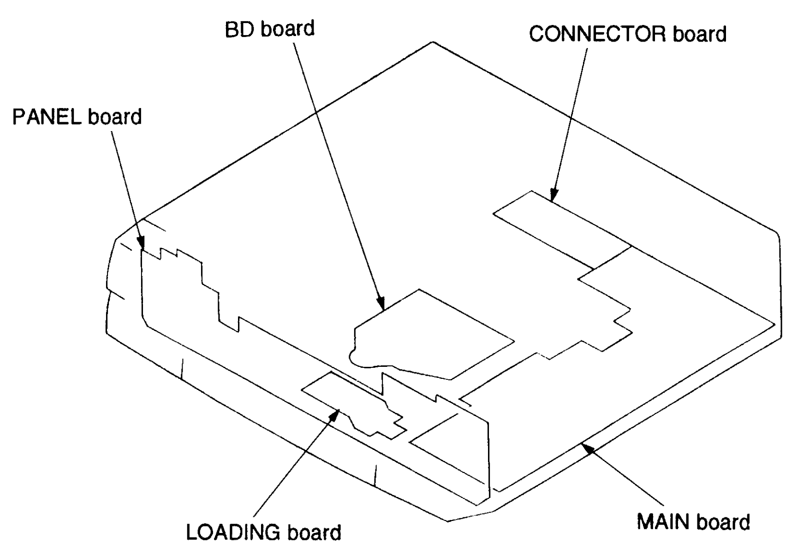
# SECTION 5
# DIAGRAMS

## 5-1. IC PIN FUNCTION

### • IC601 μPD78044AGF (SYSTEM CONTROL, FL DRIVER)

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 1-7 | T6-T0 | O | FL display grid output |
| 8 | VDD | — | +5V power supply |
| 9 | CLK | O | Serial clock output to DSP (CXD2507AQ). |
| 10 | DATA | O | Serial data output to DSP (CXD2507AQ). |
| 11 | — | — | Fixed at Ground. |
| 12 | XLAT | O | Serial data latch pulse output to DSP (CXD2507AQ). |
| 13 | PRGL | O | Serial data latch pulse output to D/F DAC (PCM1710U). |
| 14 | SQCLK | O | Sub code Q data read clock output to DSP (CXD2507AQ). |
| 15 | — | — | Not used. (Open) |
| 16 | SUBQ | I | Sub code Q data input from DSP (CXD2507AQ). |
| 17 | RESET | I | System reset input (“ L ”= Active) |
| 18 | INSW | I | S292 (load in switch) input |
| 19 | OUTSW | I | S291 (load out switch) input |
| 20 | AVSS | — | Ground |
| 21 | LDOUT | O | Output for rotating M903 (loading motor) in the loading out direction. |
| 22 | LDIN | O | Output for rotating M903 (loading motor) in the loading in direction. |
| 23 | ADJ | I | Test mode input. (“ L ”= Stops GFS check) |
| 24 | AFADJ | I | Test mode input. Fixed at “H”. (“ L ”= Test mode) |
| 25 | MODE | I | Not used. (Fixed at “ H ”.) |
| 26-28 | KEY2-KEY0 | I | Key AD input |
| 29 | AVDD | — | +5V power supply |
| 30 | AVREF | — | +5V power supply |
| 31 | — | — | Fixed at Ground. |
| 32 | — | — | Not used. (Open) |
| 33 | VSS | — | Ground |
| 34 | X1 | I | Clock input (5MHz) |
| 35 | X2 | O | Clock output (5MHz) |
| 36 | BDRST | O | BD reset output |
| 37 | BDPOWER | O | BD power ON/OFF output |
| 38 | — | — | Not used. (Open) |
| 39 | SENS | I | SENS input from DSP (CXD2507AQ). |
| 40 | AMUTE | O | Not used. (Open) |
| 41 | FSW | O | Focus switch output |
| 42 | BSOUT | O | Audio bus output |
| 43 | — | — | Not used. (Open) |
| 44 | SCOR | I | Sub code sync S0+S1 detection input |
| 45 | JOG1 | I | JOG input |
| 46 | — | — | Not used. (Open) |
| 47 | BSIN | I | Audio bus input |
| 48 | IC (VPP) | — | Connected to Ground. |
| 49 | JOG0 | I | JOG input |
| 50, 51 | — | — | Not used. (Open) |
| 52 | VDD | — | +5V power supply |
| 53-70 | S22-S5 | O | FL display segment output |
| 71 | VLOAD | — | -28V power supply for driving FL display. |
| 72-76 | S4-S0 | O | FL display segment output |
| 77-80 | T10-T7 | O | FL display grid output |

## 5-2. CIRCUIT BOARDS LOCATION

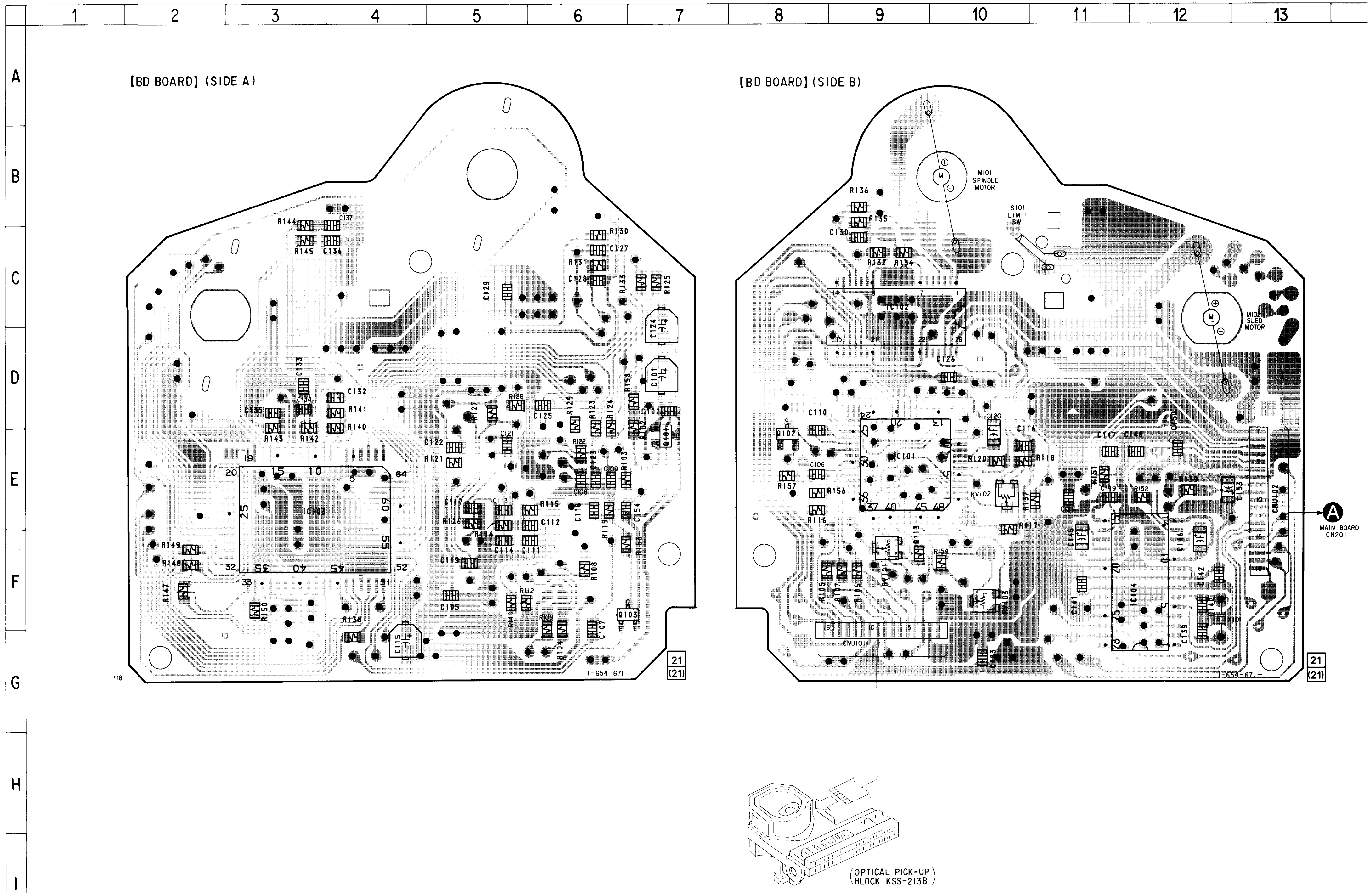

BD board
CONNECTOR board
PANEL board
LOADING board
MAIN board

**• Semiconductor Location**

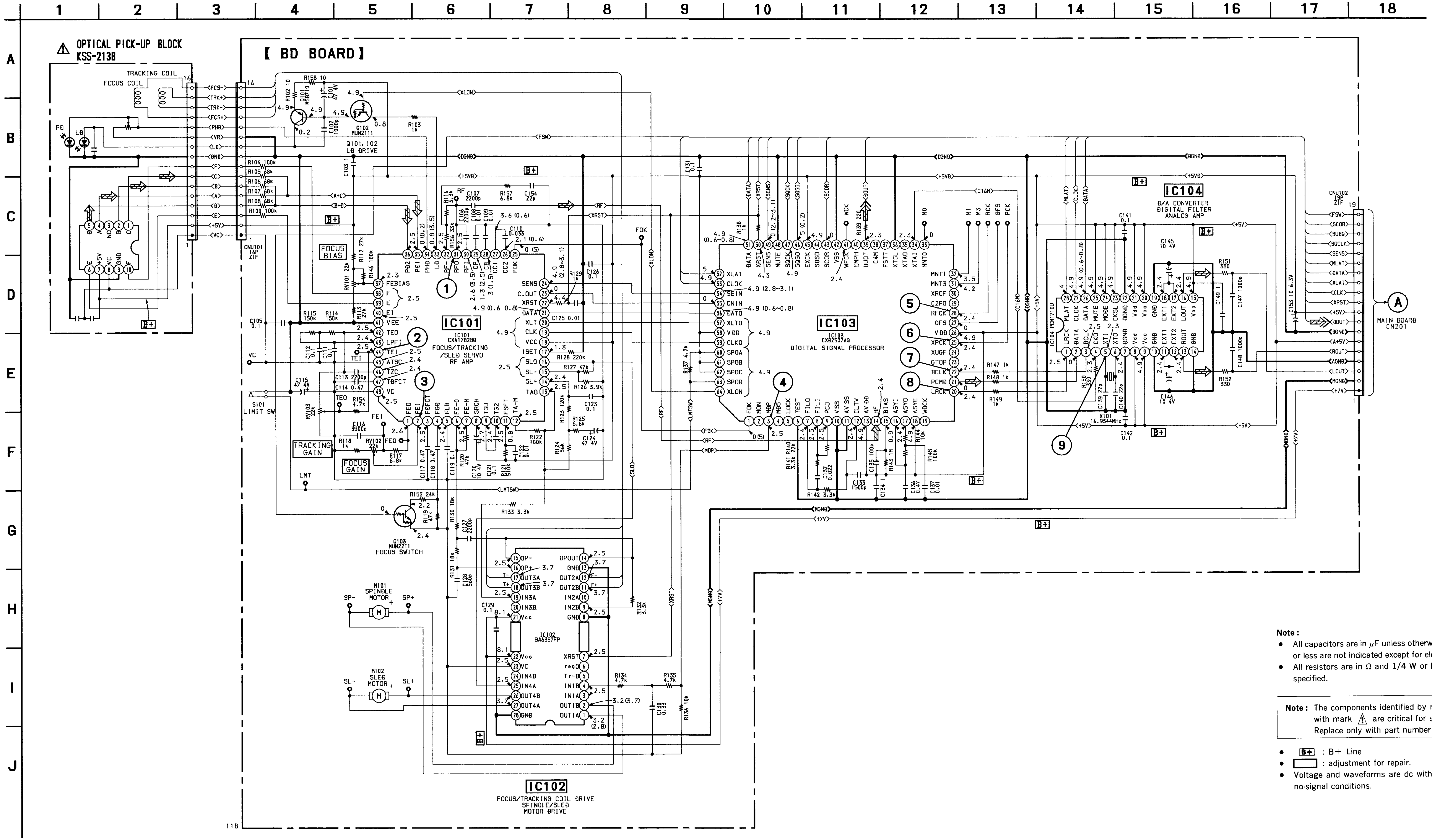
| Ref. No. | Location |
|---|---|
| IC101 | E-9 |
| IC102 | C-9 |
| IC103 | E-3 |
| IC104 | F-12 |
| Q101 | E-7 |
| Q102 | E-8 |
| Q103 | F-6 |

Note :
- ● : Through hole.
- ▨ : Pattern on the side which is seen. (The other layer's patterns are not indicated.)

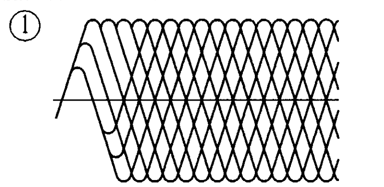
## 5-3. PRINTED WIRING BOARD — BD SECTION —

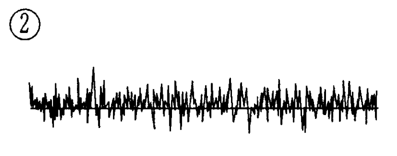

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
[BD BOARD] (SIDE A)
[BD BOARD] (SIDE B)
IC103
IC102
IC101
IC104
Q101
Q102
Q103
M101 SPINDLE MOTOR
S101 LIMIT SW
M102 SLED MOTOR
CNU102
CNU101
A
MAIN BOARD CN201
RV101
RV102
RV103
X101
1-654-671-
21
(21)
(OPTICAL PICK-UP BLOCK KSS-213B)

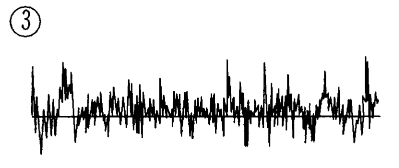
## 5-4. SCHEMATIC DIAGRAM — BD SECTION — • Refer to page 23 for IC Block Diagrams.

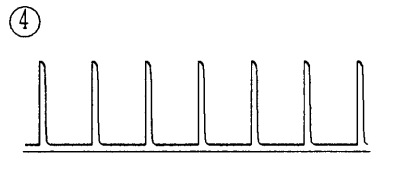

OPTICAL PICK-UP BLOCK
KSS-213B
TRACKING COIL
FOCUS COIL
【 BD BOARD 】
CNU101
16P
ZIF
Q101, 102
LD DRIVE
IC101
CXA1782BQ
FOCUS/TRACKING
/SLED SERVO
RF AMP
FOCUS BIAS
TRACKING GAIN
FOCUS GAIN
S101
LIMIT SW
Q103
MUN2211
FOCUS SWITCH
M101
SPINDLE MOTOR
M102
SLED MOTOR
IC102
BA6397FP
FOCUS/TRACKING COIL DRIVE
SPINDLE/SLED
MOTOR DRIVE
IC103
CXD2507AQ
DIGITAL SIGNAL PROCESSOR
IC104
D/A CONVERTER
DIGITAL FILTER
ANALOG AMP
X101
16.9344MHz
CNU102
19P
ZIF
A
MAIN BOARD
CN201

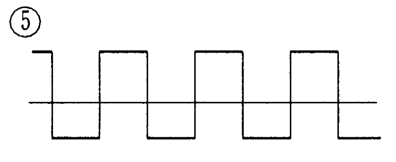
### • Waveforms

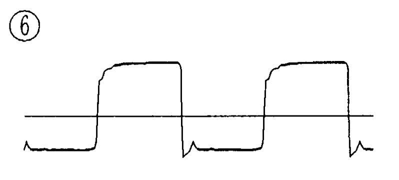

IC101㉛pin 1.4Vp-p

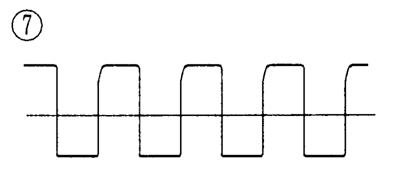

IC101(44)pin 8mVp-p 0.2ms/DIV

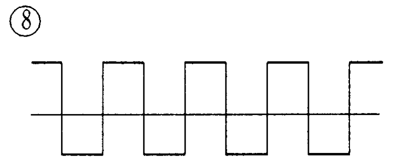

IC101②pin 20mVp-p 2ms/DIV

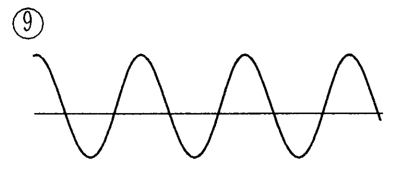

IC103③pin 2.4Vp-p 7.5μsec


IC103㉘pin 5.1mVp-p 137μsec


IC103㉕pin 5.1Vp-p 232.7sec


IC103㉒pin 5.1Vp-p 472.7nsec


IC103⑳pin 5.1Vp-p 23μsec


IC104⑤pin 3Vp-p 16.9344MHz

**Note :**

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.

**Note :** The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line
- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.

- no mark: STOP
  (     ): PLAY
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇛ : digital out

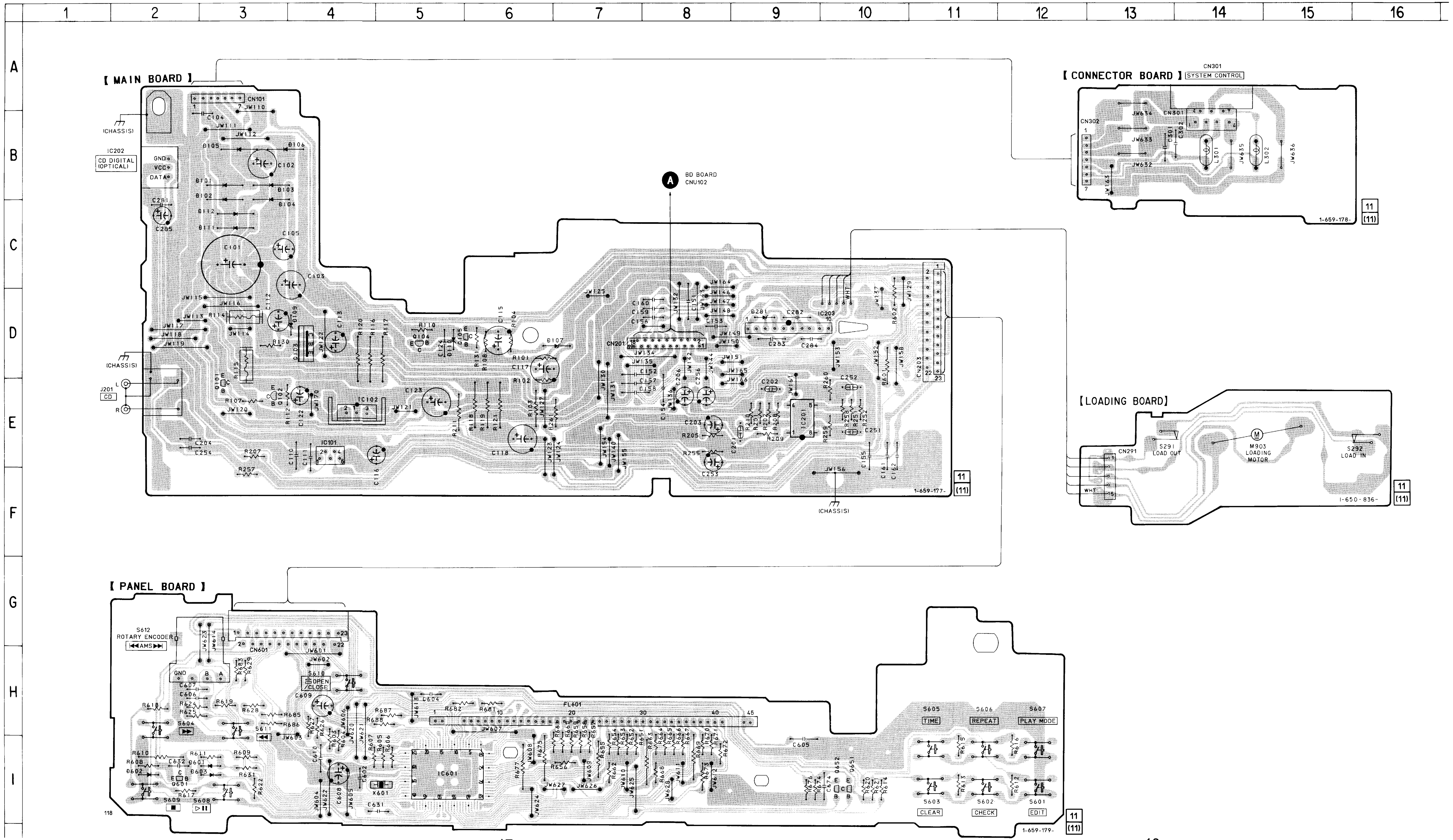
## 5-5. PRINTED WIRING BOARDS — MAIN SECTION —

### • Semiconductor Location

| Ref. No. | Location |
|---|---|
| D101 | B-3 |
| D102 | B-3 |
| D103 | B-3 |
| D104 | B-3 |
| D105 | B-3 |
| D106 | B-3 |
| D107 | D-7 |
| D109 | D-4 |
| D110 | D-5 |
| D111 | C-3 |
| D112 | C-3 |
| D281 | D-9 |
| D601 | I-3 |
| D602 | I-2 |
| D603 | I-3 |
| IC101 | E-4 |
| IC102 | E-4 |
| IC201 | E-9 |
| IC202 | B-2 |
| IC203 | D-9 |
| IC601 | I-5 |
| Q101 | E-3 |
| Q102 | E-3 |
| Q103 | D-4 |
| Q104 | D-5 |
| Q105 | D-5 |
| Q601 | I-2 |
| Q651 | I-10 |
| Q652 | I-10 |

**Note :**

- ● : Through hole.
- ▨ : Pattern on the side which is seen.
  (The other layer's patterns are not indicated.)


1
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6
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8
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10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
[ MAIN BOARD ]
CN101
(CHASSIS)
IC202
CD DIGITAL (OPTICAL)
GND
VCC
DATA
J201 CD
L
R
IC101
IC102
IC201
IC203
CN201
A BD BOARD CNU102
CN203
1-659-177-
11 (11)
[ CONNECTOR BOARD ]
CN301 SYSTEM CONTROL
CN302
1-659-178-
11 (11)
[ LOADING BOARD ]
CN291
S291 LOAD OUT
M903 LOADING MOTOR
S292 LOAD IN
WHT
1-650-836-
11 (11)
[ PANEL BOARD ]
S612 ROTARY ENCODER
◀◀AMS▶▶
CN601
GND
B
A
S610 OPEN/CLOSE
S604 ▶▶
S611 ◀◀
S609 ■
S608 ▷II
FL601
IC601
X601
S605 TIME
S606 REPEAT
S607 PLAY MODE
S603 CLEAR
S602 CHECK
S601 EDIT
1-659-179-
11 (11)

## 5-6. SCHEMATIC DIAGRAM — MAIN SECTION — • Refer to page 23 for IC Block Diagrams.

1
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22
23
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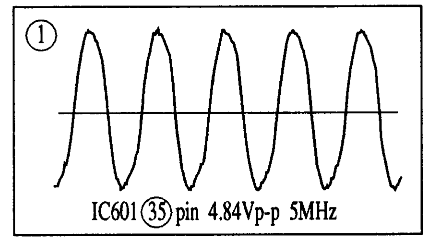
27
28
29
30
31
32
33
A
B
C
D
E
F
G
H
I
J
K
【MAIN BOARD】
IC101
L78LR05E-MA
+5V REG
IC102
+5V REG
Q101,102
POWER ON
SWITCH
Q105
2SD2025(TP)
+7V REG
Q104
2SB1041
-28V REG
OVER LOAD
DET
IC201
LINE AMP
IC202
OPTICAL DIGITAL OUTPUT
CD DIGITAL
(OPTICAL)
IC203
IC203 LB1641
LOADING MOTOR DRIVE
(CHASSIS)
BD BOARD
CNU102
A
J201
R
L
【PANEL BOARD】
IC601
SYSTEM CONTROL
FL DRIVE
FL601
X601 5MHz
S607
PLAY MODE
S606
REPEAT
S605
TIME
S603
CLEAR
S602
CHECK
S601
EDIT
S612
ROTARY ENCODER
Q651,652
GRID DRIVE
BUFFER
【LOADING BOARD】
S291 LOAD OUT
S292 LOAD IN
M901
LOADING MOTOR
【CONNECTOR BOARD】
SYSTEM CONTROL
B+
B-
1

**• Waveform**



**Note :**

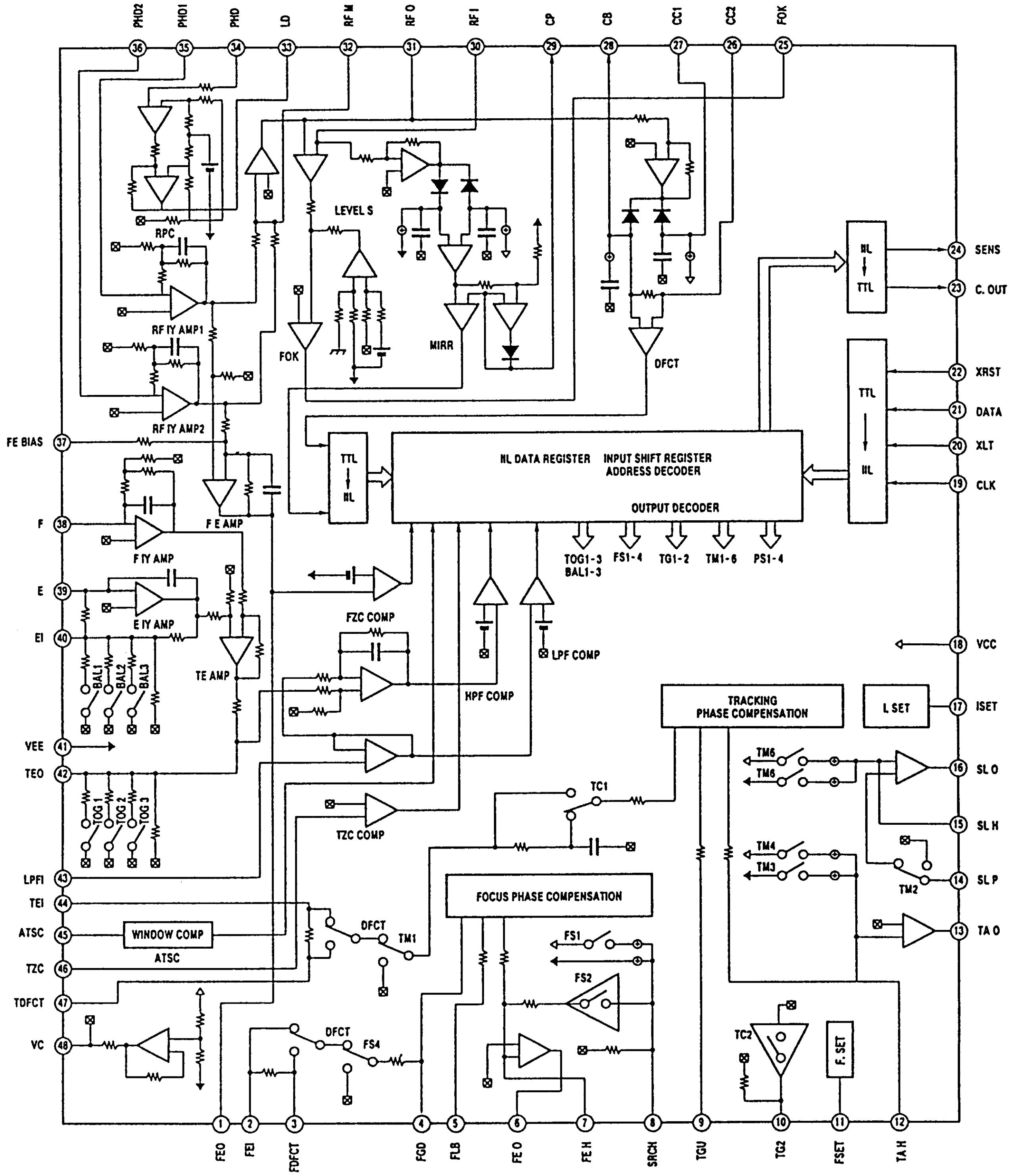
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.

**Note :** The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- **B+** : B+ Line
- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark: STOP
  ( ): PLAY
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇛ : digital out

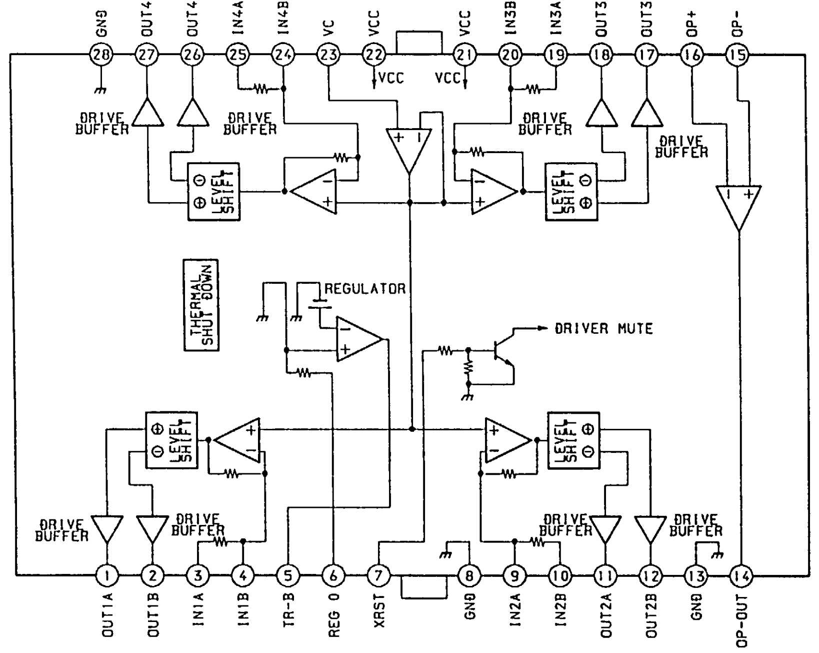
**• IC Block Diagrams**

### IC101 CXA1782BQ (BD Board)



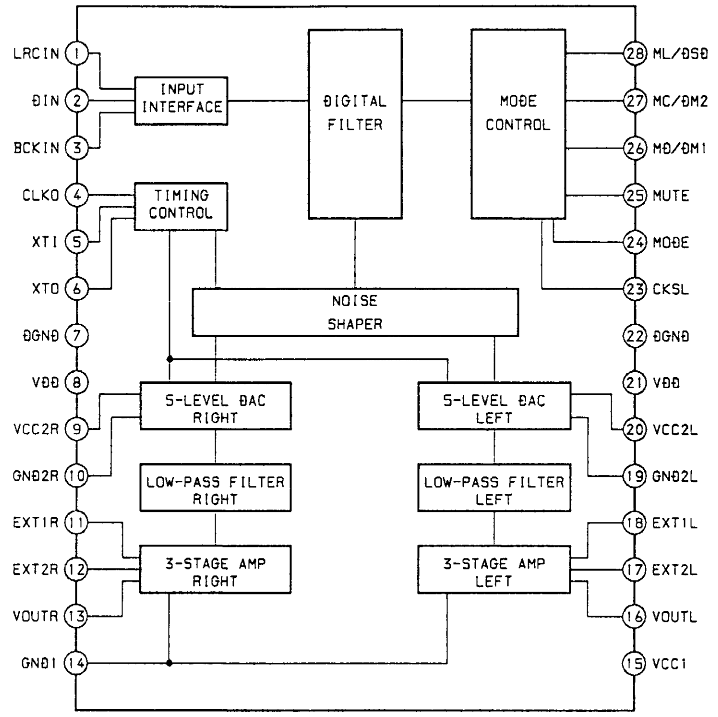
PHD2
PHD1
PHD
LD
RF M
RF O
RF I
CP
CB
CC1
CC2
FOK
SENS
C. OUT
XRST
DATA
XLT
CLK
VCC
ISET
SL O
SL M
SL P
TA O
FE BIAS
F
E
EI
VEE
TEO
LPFI
TEI
ATSC
TZC
TDFCT
VC
FEO
FEI
FDFCT
FGD
FLB
FE O
FE M
SRCH
TGU
TG2
FSET
TA M
RPC
RF I/V AMP1
RF I/V AMP2
LEVEL S
FOK
MIRR
DFCT
TTL
IIL
IIL DATA REGISTER INPUT SHIFT REGISTER
ADDRESS DECODER
OUTPUT DECODER
TOG1-3
BAL1-3
FS1-4
TG1-2
TM1-6
PS1-4
FE AMP
F I/V AMP
E I/V AMP
TE AMP
FZC COMP
LPF COMP
HPF COMP
TZC COMP
BAL1
BAL2
BAL3
TOG1
TOG2
TOG3
WINDOW COMP
ATSC
DFCT
TM1
TC1
FOCUS PHASE COMPENSATION
FS1
FS2
FS4
TRACKING PHASE COMPENSATION
L SET
TM6
TM5
TM4
TM3
TM2
TC2
F. SET

### IC102 BA6397FP



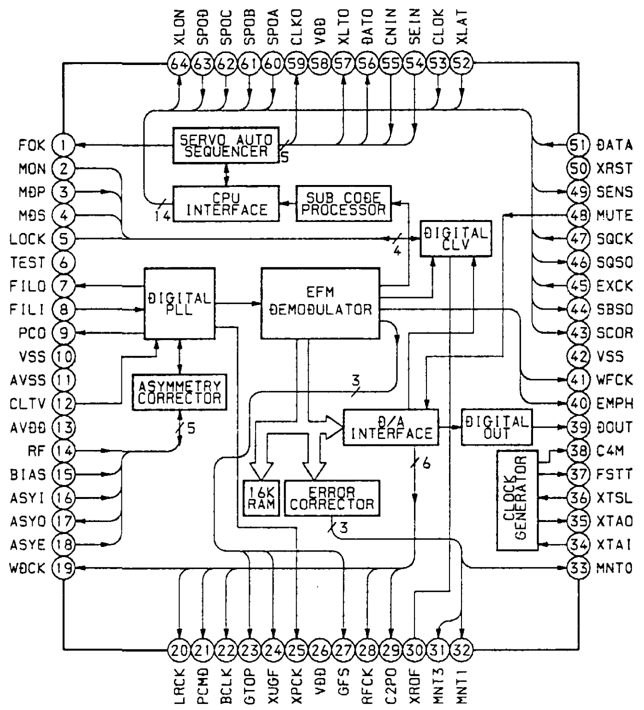
GND
OUT4A
OUT4B
IN4A
IN4B
VC
VCC
VCC
IN3B
IN3A
OUT3B
OUT3A
OP+
OP-
DRIVE BUFFER
LEVEL SHIFT
THERMAL SHUT DOWN
REGULATOR
DRIVER MUTE
OUT1A
OUT1B
IN1A
IN1B
TR-B
REG 0
XRST
GND
IN2A
IN2B
OUT2A
OUT2B
GND
OP-OUT

### IC104 PCM1710U



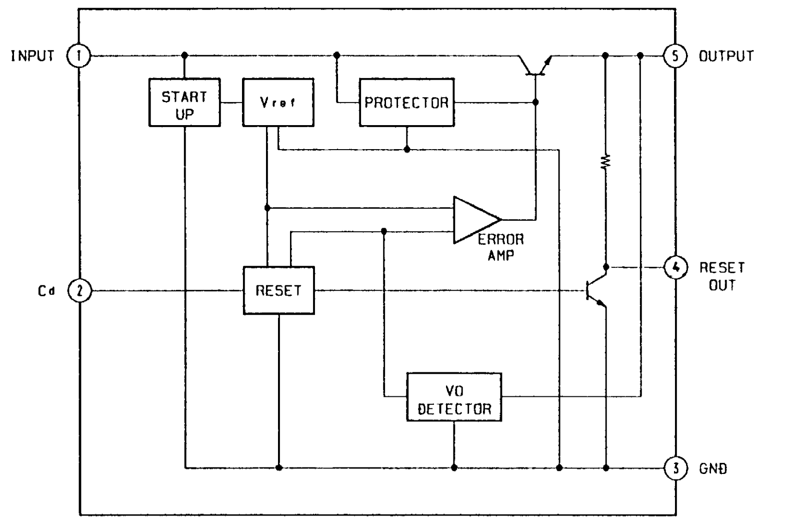
LRCIN
DIN
BCKIN
CLKO
XTI
XTO
DGND
VDD
VCC2R
GND2R
EXT1R
EXT2R
VOUTR
GND1
ML/DSD
MC/DM2
MD/DM1
MUTE
MODE
CKSL
DGND
VDD
VCC2L
GND2L
EXT1L
EXT2L
VOUTL
VCC1
INPUT INTERFACE
DIGITAL FILTER
MODE CONTROL
TIMING CONTROL
NOISE SHAPER
5-LEVEL DAC RIGHT
5-LEVEL DAC LEFT
LOW-PASS FILTER RIGHT
LOW-PASS FILTER LEFT
3-STAGE AMP RIGHT
3-STAGE AMP LEFT

### IC103 CXD2507AR



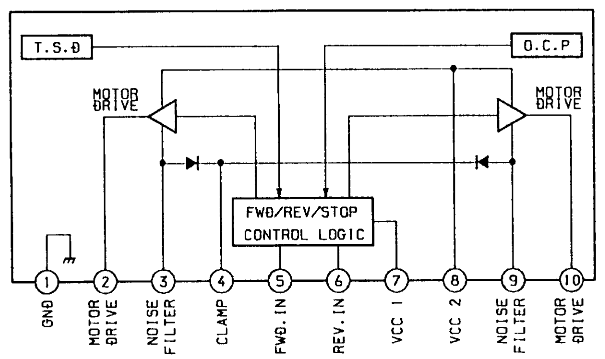
XLON
SPOD
SPOC
SPOB
SPOA
CLKO
VDD
XLTO
DATO
CNIN
SEIN
CLOK
XLAT
FOK
MON
MDP
MDS
LOCK
TEST
FILO
FILI
PCO
VSS
AVSS
CLTV
AVDD
RF
BIAS
ASYI
ASYO
ASYE
WDCK
DATA
XRST
SENS
MUTE
SQCK
SQSO
EXCK
SBSO
SCOR
VSS
WFCK
EMPH
DOUT
C4M
FSTT
XTSL
XTAO
XTAI
MNT0
LRCK
PCMD
BCLK
GTOP
XUGF
XPCK
VDD
GFS
RFCK
C2PO
XRDF
MNT3
MNT1
SERVO AUTO SEQUENCER
CPU INTERFACE
SUB CODE PROCESSOR
DIGITAL CLV
DIGITAL PLL
EFM DEMODULATOR
ASYMMETRY CORRECTOR
D/A INTERFACE
DIGITAL OUT
16K RAM
ERROR CORRECTOR
CLOCK GENERATOR

### IC101 L78LR05D (Main Board)



INPUT
Cd
OUTPUT
RESET OUT
GND
START UP
Vref
PROTECTOR
ERROR AMP
RESET
VO DETECTOR

### IC203 LB1641



T.S.D
O.C.P
MOTOR DRIVE
MOTOR DRIVE
FWD/REV/STOP CONTROL LOGIC
GND
MOTOR DRIVE
NOISE FILTER
CLAMP
FWD.IN
REV.IN
VCC 1
VCC 2
NOISE FILTER
MOTOR DRIVE

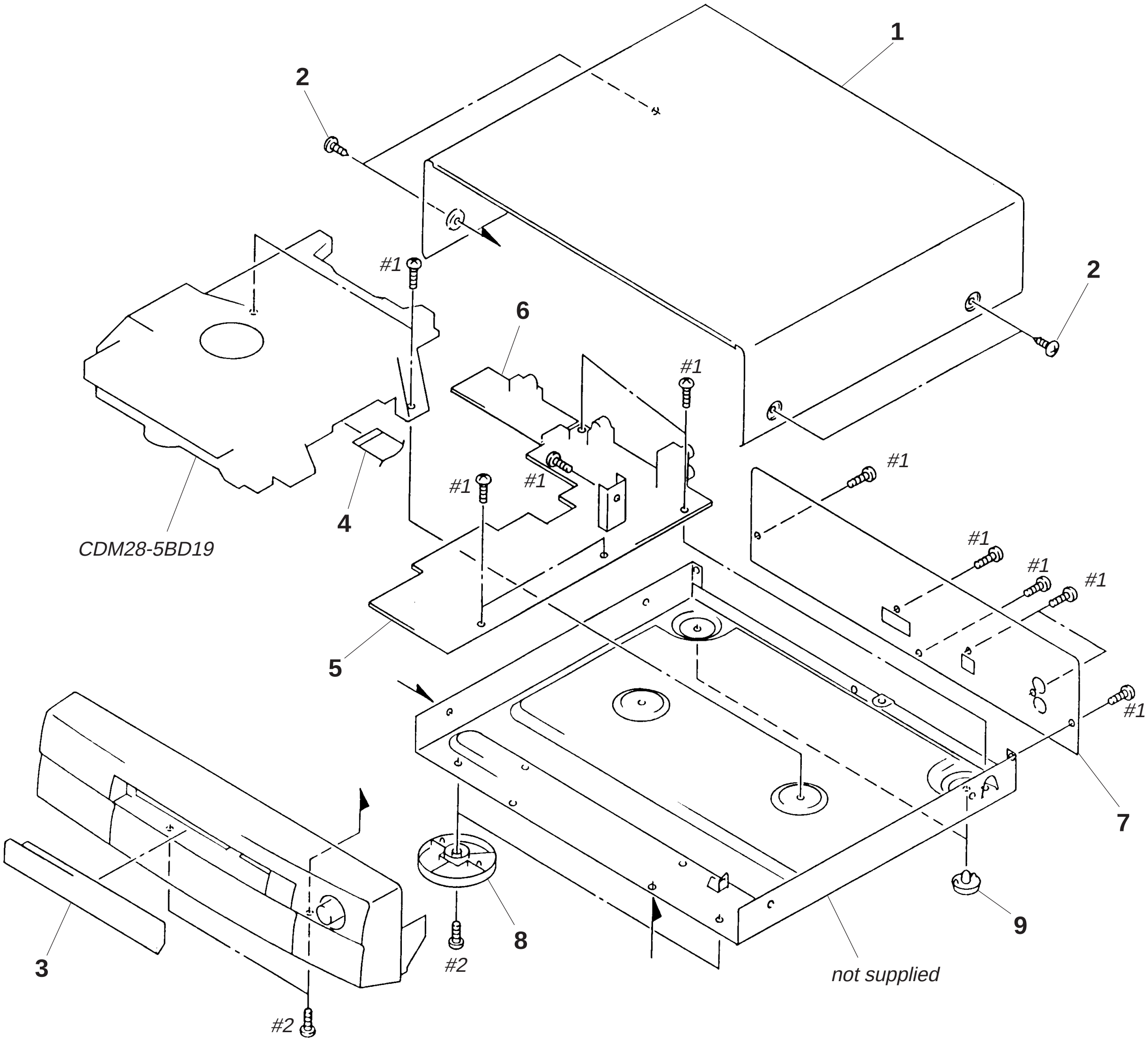
# SECTION 6
# EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  EA : Saudi Arabia model
  TH : Thai model
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ... (RED)
  ↑ Parts Color ↑ Cabinet's Color
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

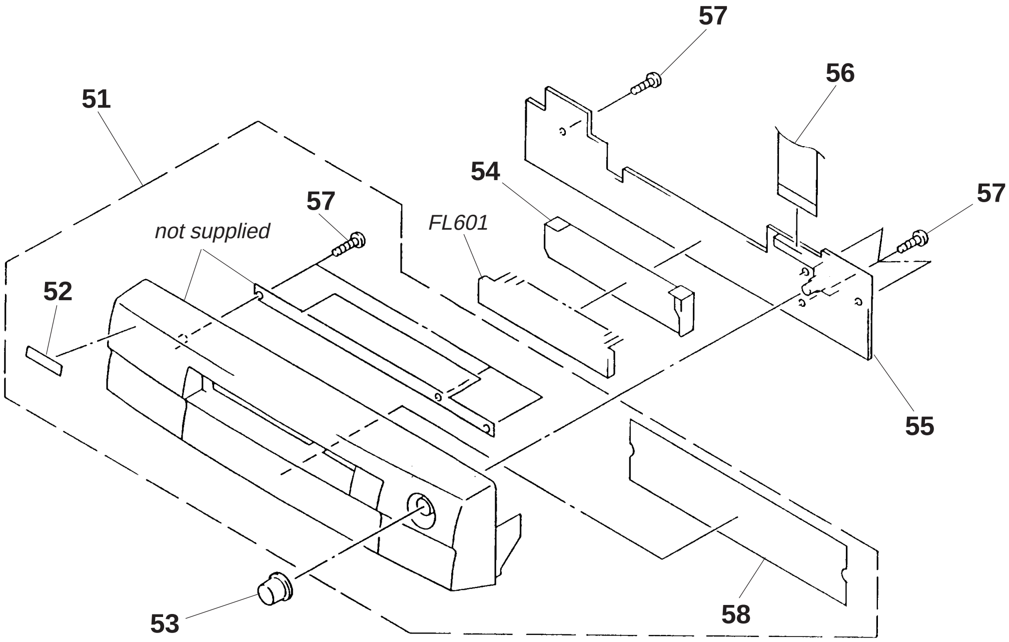
## 6-1. CHASSIS SECTION



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * 1 | 4-970-927-21 | CASE (BLACK) | |
| * 1 | 4-970-927-41 | CASE (SILVER) | |
| 2 | 3-363-099-01 | SCREW (CASE 3 TP2) | |
| 3 | 4-977-986-01 | PANEL, LOADING (E,EA,TH,AEP:SILVER) | |
| 3 | 4-977-986-21 | PANEL, LOADING (AEP,UK:BLACK) | |
| 4 | 1-769-621-11 | WIRE (FLAT TYPE) (19 CORE) | |
| * 5 | A-4673-912-A | MAIN BOARD, COMPLETE (TH) | |
| * 5 | A-4673-915-A | MAIN BOARD, COMPLETE (E,EA) | |
| * 5 | A-4673-918-A | MAIN BOARD, COMPLETE (AEP,UK) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * 6 | 1-659-178-11 | CONNECTOR BOARD | |
| * 7 | 4-977-983-01 | PANEL, BACK (E) | |
| * 7 | 4-977-983-11 | PANEL, BACK (AEP,UK:BLACK,AEP:SILVER) (Made in France) | |
| * 7 | 4-977-983-21 | PANEL, BACK (EA) | |
| * 7 | 4-977-983-31 | PANEL, BACK (TH) | |
| * 7 | 4-977-983-41 | PANEL, BACK (AEP:SILVER) (Made in Malaysia) | |
| 8 | 4-977-699-11 | LEG (F) | |
| 9 | 4-965-822-01 | FOOT | |

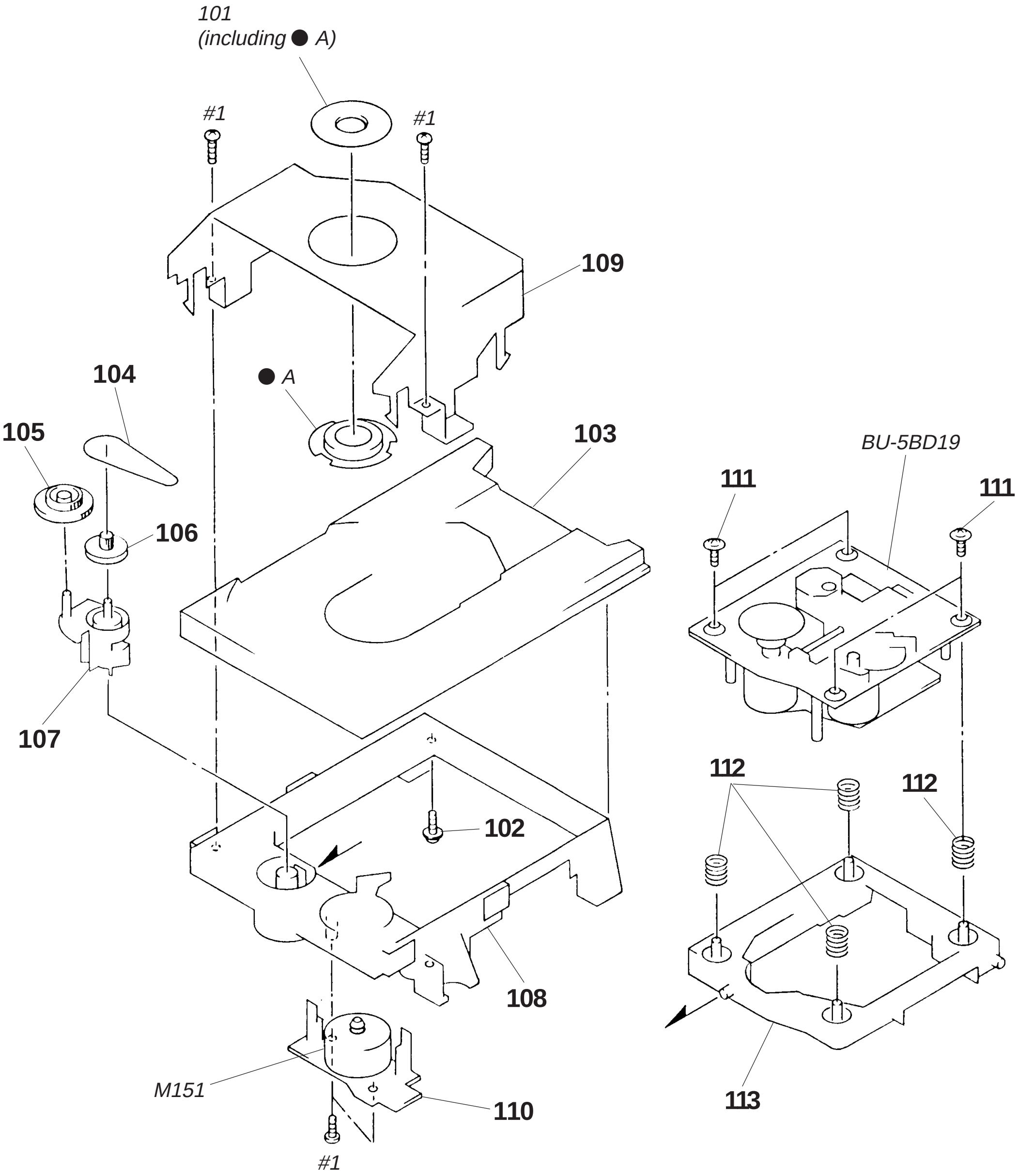
## 6-2. FRONT PANEL SECTION



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 51 | X-4946-590-1 | PANEL ASSY, FRONT (E,EA,AEP:SILVER) (Made in Malaysia) | |
| 51 | X-4946-832-1 | PANEL ASSY (B), FRONT (AEP,UK:BLACK) | |
| 51 | X-4946-852-1 | PANEL ASSY (S), FRONT (TH,AEP:SILVER) (Made in France) | |
| 52 | 4-962-708-11 | EMBLEM (4-A), SONY | |
| 53 | 4-977-987-01 | KNOB (JOG) (SILVER) | |
| 53 | 4-977-987-11 | KNOB (JOG) (BLACK) | |
| 54 | 4-979-797-01 | HOLDER (FL) | |

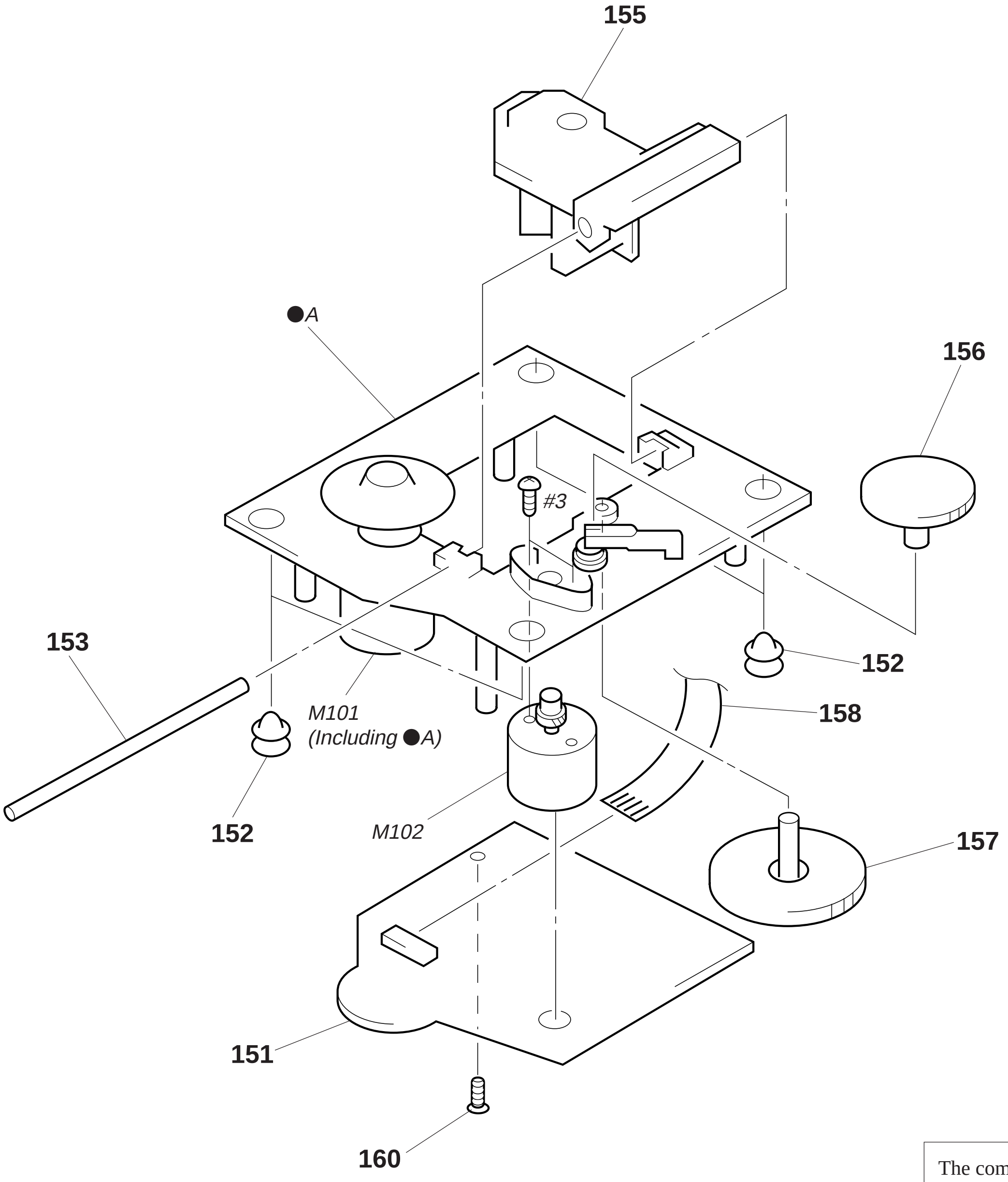
| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * 55 | A-4673-913-A | PANEL BOARD, COMPLETE (TH) | |
| * 55 | A-4673-916-A | PANEL BOARD, COMPLETE (E,EA) | |
| * 55 | A-4673-919-A | PANEL BOARD, COMPLETE (AEP,UK) | |
| 56 | 1-776-237-11 | WIRE (FLAT TYPE) (23 CORE) | |
| 57 | 4-951-620-01 | SCREW (2.6X8), +BVTP | |
| * 58 | 4-977-985-01 | SHEET (FL) | |
| FL601 | 1-517-369-11 | INDICATOR TUBE, FLUORESCENT | |

## 6-3. CD MECHANISM SECTION
## (CDM28-5BD19)


101
(including ● A)
#1
#1
109
104
● A
105
103
BU-5BD19
111
111
106
107
112
112
102
108
M151
110
113
#1

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 101 | 1-452-719-11 | MAGNET ASSY | |
| 102 | 4-917-583-21 | BRACKET, YOKE | |
| 103 | 4-960-836-01 | TABLE, DISC | |
| 104 | 4-927-649-01 | BELT | |
| 105 | 4-960-842-01 | GEAR (P) | |
| 106 | 4-960-841-01 | PULLEY (S) | |
| * 107 | 4-960-839-01 | CAM | |
| 108 | 4-960-838-03 | BASE (MD) | |
| 109 | 4-960-835-01 | HOLDER (M) | |
| * 110 | 1-650-836-11 | LOADING BOARD | |
| 111 | 4-933-134-01 | SCREW (+PTPWH M2.6X6) | |
| 112 | 4-959-996-01 | SPRING (932), COMPRESSION | |
| 113 | 4-960-834-01 | HOLDER (BU) | |
| M151 | A-4604-363-A | MOTOR (L) ASSY (LOADING) | |

## 6-4. BASE UNIT SECTION
## (BU-5BD19)


155
●A
156
#3
153
152
158
M101
(Including ●A)
152
M102
157
151
160

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * 151 | A-4673-402-A | BD BOARD, COMPLETE | |
| 152 | 4-951-940-01 | INSULATOR (BU) | |
| 153 | 4-917-565-01 | SHAFT, SLED | |
| ⚠ 155 | 8-848-367-11 | PICK-UP, OPTICAL KSS-213B/K-RP | |
| 156 | 4-917-567-01 | GEAR (M) | |
| 157 | 4-917-564-01 | GEAR (P), FLATNESS | |
| 158 | 1-769-069-11 | WIRE (FLAT TYPE) (16 CORE) | |
| 160 | 4-951-620-01 | SCREW (2.6X8), +BVTP | |
| M101 | X-4917-523-3 | BASE (OUTSERT) ASSY (SPINDLE) | |
| M102 | X-4917-504-1 | MOTOR ASSY (SLED) | |

**BD**

# SECTION 7
# ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA.. : μA.. uPA.. : μPA..
  uPB.. : μPB.. uPC.. : μPC.. uPD.. : μPD..
- CAPACITORS
  uF : μF
- COILS
  uH : μH

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

- Abbreviation
  EA : Saudi Arabia model
  TH : Thai model

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| * | A-4673-402-A | BD BOARD, COMPLETE<br>******************** | | | | |
| | | < CAPACITOR > | | | | |
| C101 | 1-126-607-11 | ELECT CHIP | 47uF | 20% | 4V | |
| C102 | 1-163-275-11 | CERAMIC CHIP | 0.001uF | 5% | 50V | |
| C103 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V | |
| C105 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C106 | 1-164-695-11 | CERAMIC CHIP | 0.0022uF | 5% | 50V | |
| C107 | 1-164-695-11 | CERAMIC CHIP | 0.0022uF | 5% | 50V | |
| C108 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | |
| C109 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | |
| C110 | 1-163-989-11 | CERAMIC CHIP | 0.033uF | 10% | 25V | |
| C111 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C112 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C113 | 1-164-695-11 | CERAMIC CHIP | 0.0022uF | 5% | 50V | |
| C114 | 1-164-005-11 | CERAMIC CHIP | 0.47uF | | 25V | |
| C115 | 1-126-607-11 | ELECT CHIP | 47uF | 20% | 4V | |
| C116 | 1-163-016-00 | CERAMIC CHIP | 0.0039uF | 10% | 50V | |
| C117 | 1-164-005-11 | CERAMIC CHIP | 0.47uF | | 25V | |
| C118 | 1-107-823-11 | CERAMIC CHIP | 0.47uF | 10% | 16V | |
| C119 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C120 | 1-135-201-11 | TANTALUM CHIP | 10uF | 20% | 4V | |
| C121 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C122 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | |
| C123 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C124 | 1-126-607-11 | ELECT CHIP | 47uF | 20% | 4V | |
| C125 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | |
| C126 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C127 | 1-164-695-11 | CERAMIC CHIP | 0.0022uF | 5% | 50V | |
| C128 | 1-163-135-00 | CERAMIC CHIP | 560PF | 5% | 50V | |
| C129 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C130 | 1-164-336-11 | CERAMIC CHIP | 0.33uF | | 25V | |
| C131 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C132 | 1-163-037-11 | CERAMIC CHIP | 0.022uF | 10% | 25V | |
| C133 | 1-163-145-00 | CERAMIC CHIP | 0.0015uF | 5% | 50V | |
| C134 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V | |
| C135 | 1-163-251-11 | CERAMIC CHIP | 100PF | 5% | 50V | |
| C136 | 1-164-005-11 | CERAMIC CHIP | 0.47uF | | 25V | |
| C137 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | |
| C139 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | |
| C140 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | |
| C141 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |
| C142 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C145 | 1-135-201-11 | TANTALUM CHIP | 10uF | 20% | 4V | |
| C146 | 1-135-201-11 | TANTALUM CHIP | 10uF | 20% | 4V | |
| C147 | 1-163-275-11 | CERAMIC CHIP | 0.001uF | 5% | 50V | |
| C148 | 1-163-275-11 | CERAMIC CHIP | 0.001uF | 5% | 50V | |
| C149 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V | |
| C153 | 1-135-259-11 | TANTAL. CHIP | 10uF | 20% | 6.3V | |
| C154 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | |
| | | < CONNECTOR > | | | | |
| CNU101 | 1-770-014-11 | CONNECTOR, FFC/FPC 16P | | | | |
| CNU102 | 1-770-013-11 | CONNECTOR, FFC/FPC 19P | | | | |
| | | < IC > | | | | |
| IC101 | 8-752-069-56 | IC | CXA1782BQ | | | |
| IC102 | 8-759-291-06 | IC | BA6397FP | | | |
| IC103 | 8-752-372-94 | IC | CXD2507AQ | | | |
| IC104 | 8-759-185-29 | IC | PCM1710U-B | | | |
| | | < TRANSISTOR > | | | | |
| Q101 | 8-729-010-08 | TRANSISTOR | MSB710-R | | | |
| Q102 | 8-729-424-08 | TRANSISTOR | UN2111 | | | |
| Q103 | 8-729-421-22 | TRANSISTOR | UN2211 | | | |
| | | < RESISTOR > | | | | |
| R102 | 1-216-001-00 | METAL CHIP | 10 | 5% | 1/10W | |
| R103 | 1-216-049-11 | METAL GLAZE | 1K | 5% | 1/10W | |
| R104 | 1-216-097-00 | METAL GLAZE | 100K | 5% | 1/10W | |
| R105-108 | 1-216-093-00 | METAL CHIP | 68K | 5% | 1/10W | |
| R109 | 1-216-097-00 | METAL GLAZE | 100K | 5% | 1/10W | |
| R112 | 1-216-083-00 | METAL CHIP | 27K | 5% | 1/10W | |
| R113 | 1-216-083-00 | METAL CHIP | 27K | 5% | 1/10W | |
| R114 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W | |
| R115 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W | |
| R116 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W | |
| R117 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W | |
| R118 | 1-216-049-11 | METAL GLAZE | 1K | 5% | 1/10W | |
| R119 | 1-216-089-00 | METAL GLAZE | 47K | 5% | 1/10W | |
| R120 | 1-216-089-00 | METAL GLAZE | 47K | 5% | 1/10W | |
| R121 | 1-216-114-00 | METAL GLAZE | 510K | 5% | 1/10W | |
| R122 | 1-216-097-00 | METAL GLAZE | 100K | 5% | 1/10W | |
| R123 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W | |
| R124 | 1-216-091-00 | METAL CHIP | 56K | 5% | 1/10W | |
| R125 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W | |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R126 | 1-216-063-00 | METAL GLAZE | 3.9K | 5% | 1/10W | |
| R127 | 1-216-089-00 | METAL GLAZE | 47K | 5% | 1/10W | |
| R128 | 1-216-105-00 | METAL GLAZE | 220K | 5% | 1/10W | |
| R129 | 1-216-049-11 | METAL GLAZE | 1K | 5% | 1/10W | |
| R130 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W | |
| R131 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W | |
| R132 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W | |
| R133 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W | |
| R134 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W | |
| R135 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W | |
| R136 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W | |
| R137 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W | |
| R138 | 1-216-049-11 | METAL GLAZE | 1K | 5% | 1/10W | |
| R139 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W | |
| R140 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W | |
| R141 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W | |
| R142 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W | |
| R143 | 1-216-121-00 | METAL GLAZE | 1M | 5% | 1/10W | |
| R144 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W | |
| R145 | 1-216-097-00 | METAL GLAZE | 100K | 5% | 1/10W | |
| R146 | 1-216-097-00 | METAL GLAZE | 100K | 5% | 1/10W | |
| R147-149 | 1-216-049-11 | METAL GLAZE | 1K | 5% | 1/10W | |
| R150-152 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W | |
| R153 | 1-216-082-00 | METAL GLAZE | 24K | 5% | 1/10W | |
| R154 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W | |
| R156 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W | |
| R157 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W | |
| R158 | 1-216-001-00 | METAL CHIP | 10 | 5% | 1/10W | |
| | | < VARIABLE RESISTOR > | | | | |
| RV101 | 1-241-396-11 | RES, ADJ, METAL GLAZE 22K | | | | |
| RV102 | 1-241-396-11 | RES, ADJ, METAL GLAZE 22K | | | | |
| RV103 | 1-241-396-11 | RES, ADJ, METAL GLAZE 22K | | | | |
| | | < SWITCH > | | | | |
| S101 | 1-572-085-11 | SWITCH, LEAF (LIMIT SW) | | | | |
| | | < VIBRATOR > | | | | |
| X101 | 1-579-280-11 | VIBRATOR, CRYSTAL (16.9344MHz) | | | | |

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| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| * | 1-659-178-11 | CONNECTOR BOARD<br>***************** | | | | |
| | | < CAPACITOR > | | | | |
| C301 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C302 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| | | < CONNECTOR > | | | | |
| CN301 | 1-770-158-21 | HOUSING, CONNECTOR 7P (SYSTEM CONTROL) | | | | |
| CN302 | 1-770-031-11 | CONNECTOR, BOARD TO BOARD 7P | | | | |
| | | < COIL > | | | | |
| L301 | 1-410-464-11 | INDUCTOR 3.3uH | | | | |
| L302 | 1-410-464-11 | INDUCTOR 3.3uH | | | | |

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| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| * | 1-650-836-11 | LOADING BOARD<br>************** | | | | |
| | | < CONNECTOR > | | | | |
| * CN291 | 1-568-943-11 | PIN, CONNECTOR 5P | | | | |
| | | < SWITCH > | | | | |
| S291 | 1-572-086-11 | SWITCH, LEAF (LOAD OUT) | | | | |
| S292 | 1-572-086-11 | SWITCH, LEAF (LOAD IN) | | | | |

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| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| * | A-4673-912-A | MAIN BOARD, COMPLETE (TH) | | | | |
| * | A-4673-915-A | MAIN BOARD, COMPLETE (E,EA) | | | | |
| * | A-4673-918-A | MAIN BOARD, COMPLETE (AEP,UK)<br>********************* | | | | |
| | 1-537-770-21 | TERMINAL BOARD, GROUND | | | | |
| | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | | | | |
| | | < CAPACITOR > | | | | |
| C101 | 1-126-936-11 | ELECT | 3300uF | 20% | 16V | |
| C102 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C103 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C104 | 1-161-494-00 | CERAMIC | 0.022uF | | 25V | |
| C105 | 1-126-933-11 | ELECT | 100uF | 20% | 16V | |
| C110 | 1-161-494-00 | CERAMIC | 0.022uF | | 25V | |
| C111 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C112 | 1-126-933-11 | ELECT | 100uF | 20% | 16V | |
| C113 | 1-126-933-11 | ELECT | 100uF | 20% | 16V | |
| C115 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| C116 | 1-126-933-11 | ELECT | 100uF | 20% | 10V | |
| C117 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C118 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C122 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | |
| C123 | 1-126-925-11 | ELECT | 470uF | 20% | 10V | |
| C124 | 1-162-306-11 | CERAMIC | 0.01uF | 30% | 16V | |
| C151-155 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C156 | 1-161-494-00 | CERAMIC | 0.022uF | | 25V | |
| C157 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C158 | 1-162-290-31 | CERAMIC | 470PF | 10% | 50V | |
| C159-162 | 1-162-294-31 | CERAMIC | 0.001uF | 10% | 50V | |
| C201 | 1-130-475-00 | MYLAR | 0.0022uF | 5% | 50V | |
| C202 | 1-130-475-00 | MYLAR | 0.0022uF | 5% | 50V | |
| C203 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| C204 | 1-162-294-31 | CERAMIC | 0.001uF | 10% | 50V | |

## MAIN PANEL

| | Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|---|
| | C206 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| | C251 | 1-130-475-00 | MYLAR | 0.0022uF | 5% | 50V | |
| | C252 | 1-130-475-00 | MYLAR | 0.0022uF | 5% | 50V | |
| | C253 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| | C254 | 1-162-294-31 | CERAMIC | 0.001uF | 10% | 50V | |
| | C256 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| | C281-283 | 1-162-306-11 | CERAMIC | 0.01uF | 30% | 16V | |
| | C284 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| | C285 | 1-126-963-11 | ELECT | 4.7uF | 20% | 50V | |
| | | | < CONNECTOR > | | | | |
| * | CN101 | 1-691-406-11 | CONNECTOR, BOARD TO BOARD 7P | | | | |
| | CN201 | 1-770-167-11 | CONNECTOR, FFC/FPC 19P | | | | |
| * | CN203 | 1-568-839-11 | SOCKET, CONNECTOR 23P | | | | |
| | | | < DIODE > | | | | |
| | D101 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D102 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D103 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D104 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D105 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D106 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D107 | 8-719-982-03 | DIODE | MTZJ-3.6A | | | |
| | D109 | 8-719-933-50 | DIODE | HZS7C2L | | | |
| | D110 | 8-719-982-19 | DIODE | MTZJ-30A | | | |
| | D111 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D112 | 8-719-200-82 | DIODE | 11ES2 | | | |
| | D281 | 8-719-109-71 | DIODE | RD3.9ES-B1 | | | |
| | | | < IC > | | | | |
| | IC101 | 8-759-805-37 | IC | L78LR05D | | | |
| | IC102 | 8-759-231-53 | IC | TA7805S | | | |
| | IC201 | 8-759-900-72 | IC | NE5532P | | | |
| | IC202 | 8-749-923-04 | IC | TOTX178 (CD DIGITAL,OPTICAL) | | | |
| | IC203 | 8-759-822-09 | IC | LB1641 | | | |
| | | | < JACK > | | | | |
| | J201 | 1-770-272-11 | JACK, PIN 2P (CD) | | | | |
| | | | < TRANSISTOR > | | | | |
| | Q101 | 8-729-900-80 | TRANSISTOR | DTC114ES | | | |
| | Q102 | 8-729-118-00 | TRANSISTOR | 2SB1116-L | | | |
| | Q103 | 8-729-030-18 | TRANSISTOR | 2SD2525 | | | |
| | Q104 | 8-729-019-64 | TRANSISTOR | 2SB1041 | | | |
| | Q105 | 8-729-119-76 | TRANSISTOR | 2SA1175-HFE | | | |
| | | | < RESISTOR > | | | | |
| | R101 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| | R102 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| | R103 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| | R104 | 1-247-807-11 | CARBON | 100 | 5% | 1/4W | |
| | R107 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |

| | Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|---|
| | R108 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| | R110 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| | R112 | 1-249-419-11 | CARBON | 1.5K | 5% | 1/4W | |
| ⚠ | R114 | 1-219-139-11 | FUSIBLE | 0.68 | 10% | 1/4W | F |
| ⚠ | R115 | 1-217-641-00 | FUSIBLE | 4.7 | 5% | 1/4W | F |
| | R116-121 | 1-260-091-11 | CARBON | 220 | 5% | 1/2W | |
| | R130 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| | R131 | 1-247-791-00 | CARBON | 22 | 5% | 1/4W | |
| | R201 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| | R202 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| | R205 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| | R207 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| | R208 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| | R209 | 1-249-428-11 | CARBON | 8.2K | 5% | 1/4W | |
| | R210 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| | R211 | 1-247-807-11 | CARBON | 100 | 5% | 1/4W | |
| | R251 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| | R252 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| | R255 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| | R257 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| | R258 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| | R259 | 1-249-428-11 | CARBON | 8.2K | 5% | 1/4W | |
| | R260 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| | R261 | 1-247-815-00 | CARBON | 220 | 5% | 1/4W | |
| | R601 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| | R602 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| ************************************************************** | | | | | | | |
| * | | A-4673-913-A | PANEL BOARD, COMPLETE (TH) | | | | |
| * | | A-4673-916-A | PANEL BOARD, COMPLETE (E,EA) | | | | |
| * | | A-4673-919-A | PANEL BOARD, COMPLETE (AEP,UK) | | | | |
| | | | ********************** | | | | |
| * | | 4-979-797-01 | HOLDER (FL) | | | | |
| | | | < CAPACITOR > | | | | |
| | C602 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| | C604 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| | C605 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| | C606 | 1-162-301-11 | CERAMIC | 0.0015uF | 30% | 16V | |
| | C607 | 1-162-301-11 | CERAMIC | 0.0015uF | 30% | 16V | |
| | C608 | 1-126-177-11 | ELECT | 100uF | 20% | 10V | |
| | C609 | 1-124-916-11 | ELECT | 22uF | 20% | 63V | |
| | C610 | 1-162-306-11 | CERAMIC | 0.01uF | 30% | 16V | |
| | C631 | 1-162-286-21 | CERAMIC | 220PF | 10% | 50V | |
| | C632 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| | C674 | 1-162-290-31 | CERAMIC | 470PF | 10% | 50V | |
| | | | < CONNECTOR > | | | | |
| * | CN601 | 1-568-865-11 | SOCKET, CONNECTOR 23P | | | | |

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < DIODE > | |
| D601 | 8-719-815-85 | DIODE 1S1585 | |
| D602 | 8-719-815-85 | DIODE 1S1585 | |
| D603 | 8-719-815-85 | DIODE 1S1585 | |
| | | < FLUORESCENT INDICATOR TUBE > | |
| FL601 | 1-517-369-11 | INDICATOR TUBE, FLUORESCENT | |
| | | < IC > | |
| IC601 | 8-759-340-60 | IC uPD78044AGF-091-3B9 | |
| | | < TRANSISTOR > | |
| Q601 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q651 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q652 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| | | < RESISTOR > | |
| R603 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R604 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R605-607 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R608 | 1-249-393-11 | CARBON 10 5% 1/4W | |
| R609-611 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R612 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R613 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R614 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R615 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R616 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R617 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R618 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R619 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R620-622 | 1-249-423-11 | CARBON 3.3K 5% 1/4W | |
| R624 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R625 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R626-629 | 1-247-807-11 | CARBON 100 5% 1/4W | |
| R631 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R651-674 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R675 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R676 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R677 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R681-683 | 1-247-807-11 | CARBON 100 5% 1/4W | |
| R685-688 | 1-247-807-11 | CARBON 100 5% 1/4W | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < SWITCH > | |
| S601 | 1-554-303-21 | SWITCH, TACTILE (EDIT) | |
| S602 | 1-554-303-21 | SWITCH, TACTILE (CHECK) | |
| S603 | 1-554-303-21 | SWITCH, TACTILE (CLEAR) | |
| S604 | 1-554-303-21 | SWITCH, TACTILE (▶▶) | |
| S605 | 1-554-303-21 | SWITCH, TACTILE (TIME) | |
| S606 | 1-554-303-21 | SWITCH, TACTILE (REPEAT) | |
| S607 | 1-554-303-21 | SWITCH, TACTILE (PLAY MODE) | |
| S608 | 1-554-303-21 | SWITCH, TACTILE (▷ ❚❚) | |
| S609 | 1-554-303-21 | SWITCH, TACTILE (■) | |
| S610 | 1-554-303-21 | SWITCH, TACTILE (⏏ OPEN/CLOSE) | |
| S611 | 1-554-303-21 | SWITCH, TACTILE (◀◀) | |
| S612 | 1-467-938-11 | ENCODER, ROTARY (⏮ AMS ⏭) | |
| | | < VIBRATOR > | |
| X601 | 1-579-233-11 | VIBRATOR, CERAMIC (5MHz) | |

*******************************************************************

MISCELLANEOUS
**************

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 4 | 1-769-621-11 | WIRE (FLAT TYPE) (19 CORE) | |
| 56 | 1-776-237-11 | WIRE (FLAT TYPE) (23 CORE) | |
| 101 | 1-452-719-11 | MAGNET ASSY | |
| ⚠ 155 | 8-848-367-11 | PICK-UP, OPTICAL KSS-213B/K-RP | |
| 158 | 1-769-069-11 | WIRE (FLAT TYPE) (16 CORE) | |
| M101 | X-4917-523-3 | BASE (OUTSERT) ASSY (SPINDLE) | |
| M102 | X-4917-504-1 | MOTOR ASSY (SLED) | |
| M151 | A-4604-363-A | MOTOR (L) ASSY (LOADING) | |

*******************************************************************

**************
HARDWARE LIST
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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| #1 | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | |
| #2 | 7-685-647-79 | SCREW +BVTP 3X10 TYPE2 N-S | |
| #3 | 7-621-255-15 | SCREW +P 2X3 | |

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

**9-960-505-11**

**Sony Corporation**
**Consumer A&V Products Company**
**Home A&V Products Div.**

**English**
96B0478-1
Printed in Japan
Ⓒ1996.2
**Published by Home A&V Products Div.**
**Quality Engineering Dept.**

# TA-EX50/EX90

# SERVICE MANUAL

*AEP Model*
*UK Model*
*TA-EX50/EX90*
*E Model*
*TA-EX50*

SONY
MHC-EX90
VIDEO
VIDEO2/AUX
TAPE
MD
CD
TUNER

TA-EX50/EX90 is the amplifier section
in MHC-EX50, MHC-EX90.

**Photo : TA-EX90**

## SPECIFICATIONS

DIN power output 45 W + 45 W (6 ohms, at 1 kHz, DIN) (EX50: AEP, UK, G, IT, CIS models)
50 W + 50 W (6 ohms, at 1 kHz, DIN) (EX90)

Continuous RMS power output
55 W + 55 W (6 ohms, at 1 kHz, 10% THD) (EX50: AEP, UK, G, IT, CIS models)
50 W + 50 W (6 ohms, at 1 kHz, 5% THD) (EX50: EXCEPT AEP, UK, G, IT, CIS models)
65 W + 65 W (6 ohms, at 1 kHz, 10% THD) (EX90)

Music power output
95 W + 95 W (6 ohms, at 1 kHz, 10% THD) (EX50: AEP, UK, G, IT, CIS models)
120 W + 120 W (6 ohms, at 1 kHz, 10% THD) (EX90)

| **Input** | **Jack type** | **Sensitivity** | **Impedance** |
|---|---|---|---|
| CD | Phono | 450 mV | 47 kilohms |
| MD | Phono | 450 mV | 47 kilohms |
| TUNER | Phono | 250 mV | 47 kilohms |
| VIDEO1 | Phono | 250 mV | 47 kilohms |
| VIDEO2/ AUX | Phono | 250 mV | 47 kilohms |
| TAPE | Phono | 250 mV | 47 kilohms |

| **Output** | **Jack type** | **Voltage** | **Impedance** |
|---|---|---|---|
| MD | Phono | 250 mV | 1 kilohm |
| VIDEO1 | Phono | 250 mV | 1 kilohm |
| TAPE | Phono | 250 mV | 1 kilohm |
| PHONES | Stereo phone | – | Accepts headphones of 8 ohms or more |

Dimensions
Approx. 280 x 122.5 x 290 mm (11 1/8 x 4 7/8 x 11 1/2 in) (w/h/d) incl. projecting parts and controls

Mass Approx. 5.3 kg (11 lb 10 oz)

**General**

Power requirements
220 – 230 V AC, 50/60 Hz (EX50: AEP, UK, G, IT, CIS, EX90 models)
220 V AC, 50/60 Hz (EX50: TH)
110 – 120 V or 220 – 240 V AC, 50/60 Hz Adjustable with the voltage selector (EX50: EXCEPT AEP, UK, G, IT, CIS, TH models)

Power consumption
135 W (system) (EX50: AEP, UK, G, IT, CIS models)
145 W (system) (EX50: EXCEPT AEP, UK, G, IT, CIS models)
155 W (active speaker not included) (EX90)

Design and specifications are subject to change without notice.

- Abbreviation
  G : German model.
  IT : Italian model.
  TH : Thailand model.

# INTEGRATED STEREO AMPLIFIER

**SONY**®

## TABLE OF CONTENTS

Section Title Page

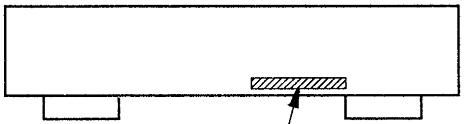
SECTION 1. GENERAL .................................................... 3

SECTION 2. DIAGRAMS
2-1. Circuit Boards Location .................................................... 4
2-2. IC Pin Function
• IC101 System Control (M37471M2-461SP) ................. 5
2-3. Printed Wiring Board — Main Section — ........................ 6
2-4. Schematic Diagram — Main Section — ......................... 9
2-5. Schematic Diagram — Panel Section — ........................ 14
2-6. Printed Wiring Board — Panel Section — ...................... 16

SECTION 3. EXPLODED VIEWS
3-1. Front Panel and Case Section ........................................ 19
3-2. Chassis Section ............................................................... 20

SECTION 4. ELECTRICAL PARTS LIST ........................ 21

## MODEL IDENTIFICATION
*— BACK PANEL —*



PART NO.

| MODEL | PARTS No. |
|---|---|
| EX50 : E model | 4-978-966-0□ |
| Malaysia model | |
| Singapore model | |
| Hong Kong model | 4-978-966-1□ |
| Saudi Arabia model | 4-978-966-3□ |
| Thailand model | 4-978-966-4□ |
| AEP model | 4-978-969-0□ |
| German model | 4-978-969-1□ |
| Italian model | 4-978-969-2□ |
| UK model | 4-978-969-3□ |
| CIS model | 4-978-969-5□ |
| EX90 : AEP model | 4-978-974-0□ |
| Italian model | 4-978-974-2□ |
| UK model | 4-978-974-3□ |

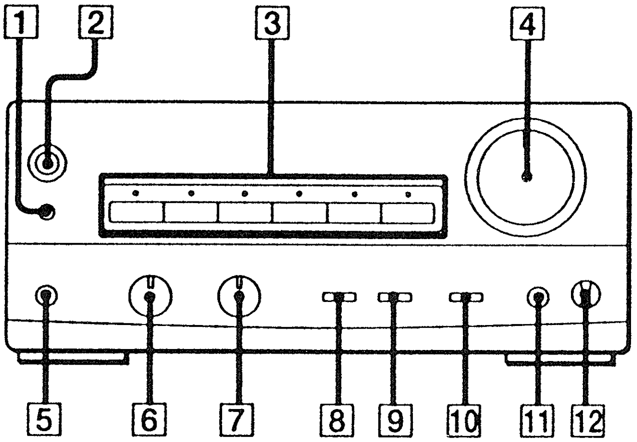
**SAFETY-RELATED COMPONENT WARNING !!**

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

# SECTION 1
# GENERAL

This section is extracted from instruction manual.

## Identifying the Parts



1 Remote sensor
2 SYSTEM POWER switch and ON/STANDBY indicator (7)
The indicator remains lit as long as the AC power cord is connected to a wall outlet.
3 Function buttons* (17, 21, 22)
VIDEO 1 (22)
VIDEO 2/AUX (22)
TAPE
MD
CD (13, 17, 21)
TUNER (17)
4 VOLUME control (5, 7, 18, 19)
5 PHONES jack (18, 22)
6 BASS control (18)
7 TREBLE control (18)
8 SOURCE DIRECT button* (18)
9 MUTING button* (18)
10 KARAOKE PON button* (21)
(EX50: E, EA, HK, SP, MY, TH models)
11 MIX MIC jack (phone jack) (21, 22)
(EX50: E, EA, HK, SP, MY, TH models)
12 MIC LEVEL control (21)
(EX50: E, EA, HK, SP, MY, TH models)

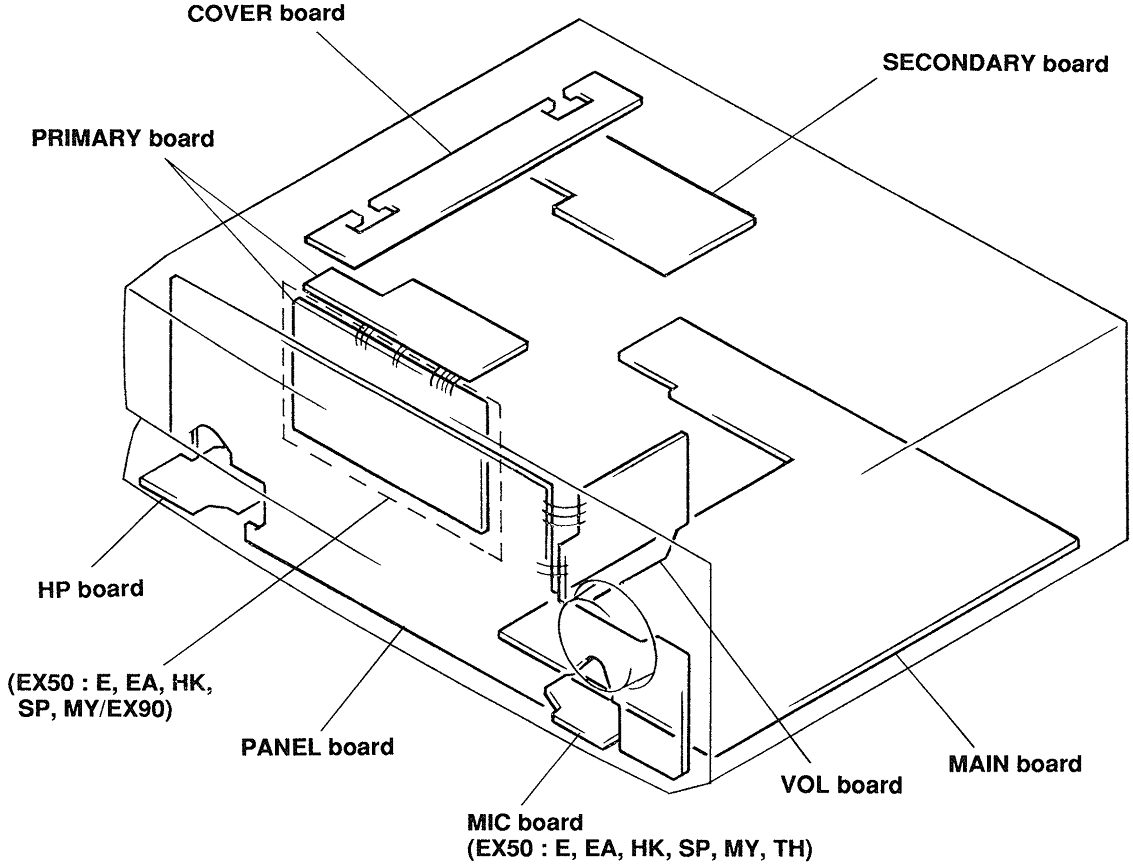
- Abbreviation

EA : Saudi Arabia model.
HK : Hong Kong model.
SP : Singapore model.
MY : Malaysia model.
TH : Thailand model.

# SECTION 2

# DIAGRAMS

## 2-1. CIRCUIT BOARDS LOCATION


COVER board
SECONDARY board
PRIMARY board
HP board
(EX50 : E, EA, HK, SP, MY/EX90)
PANEL board
MIC board
(EX50 : E, EA, HK, SP, MY, TH)
VOL board
MAIN board

- Abbreviation

| | |
|---|---|
| EA | : Saudi Arabia model. |
| HK | : Hong Kong model. |
| SP | : Singapore model. |
| MY | : Malaysia model. |
| TH | : Thailand model. |

## 2-2. IC PIN FUNCTION

### • IC101 SYSTEM CONTROL (M37471M2-461SP)

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 1 | —— | – | Not used. (Ground) |
| 2 | —— | – | |
| 3 | —— | – | |
| 4 | —— | – | |
| 5 | POWER RELAY | O | Power relay control output. |
| 6 | LINE MUTE 2 | O | Pre amp mute output. |
| 7 | LINE MUTE 1 | O | Line mute output. |
| 8 | VOL UP | O | Volume up control output. |
| 9 | VOL DOWN | O | Volume down control output. |
| 10 | K-PON | O | KARAOKE PON control output. |
| 11 | —— | – | Not used. (Ground) |
| 12 | —— | – | |
| 13 | —— | – | |
| 14 | —— | – | |
| 15 | MIC IN | I | Microphone detect input. (not used: +5V) |
| 16 | KEY 1 | I | Key input. (analog) |
| 17 | KEY 0 | I | |
| 18 | VREF | – | Reference voltage input (+5V). |
| 19 | XIN | I | System clock input (8 MHz). |
| 20 | XOUT | O | System clock output (8 MHz). |
| 21 | Vss | – | Ground |
| 22 | Vcc | – | Power supply (+5V). |
| 23 | MODEL | I | Destination identification input. |
| 24 | —— | – | Not used. (Ground) |
| 25 | $\overline{\text{RESET}}$ | I | Reset signal input. |
| 26 | —— | – | Not used. (Ground) |
| 27 | AU BUS IN | I | Audio bus signal input. |
| 28 | SIRCS IN | I | SIRCS signal input. |
| 29 | —— | – | Not used. (Ground) |
| 30 | AU BUS OUT | O | Audio bus signal output. |
| 31 | AFUNC 0 | O | Function control output. |
| 32 | AFUNC 1 | O | |
| 33 | AFUNC 2 | O | |
| 34 | VIDEO 1 | O | Function LED control output. |
| 35 | VIDEO 2 | O | |
| 36 | TAPE | O | |
| 37 | MD | O | |
| 38 | CD | O | |
| 39 | TUNER | O | |
| 40 | –20 dB MUTE | O | –20 dB muting control output. |
| 41 | SOURCE DIRECT | O | SOURCE DIRECT control output. |
| 42 | —— | – | Not used. (Ground) |

## 2-3. PRINTED WIRING BOARD — MAIN SECTION —

• See page 4 for Circuit Boards Location.

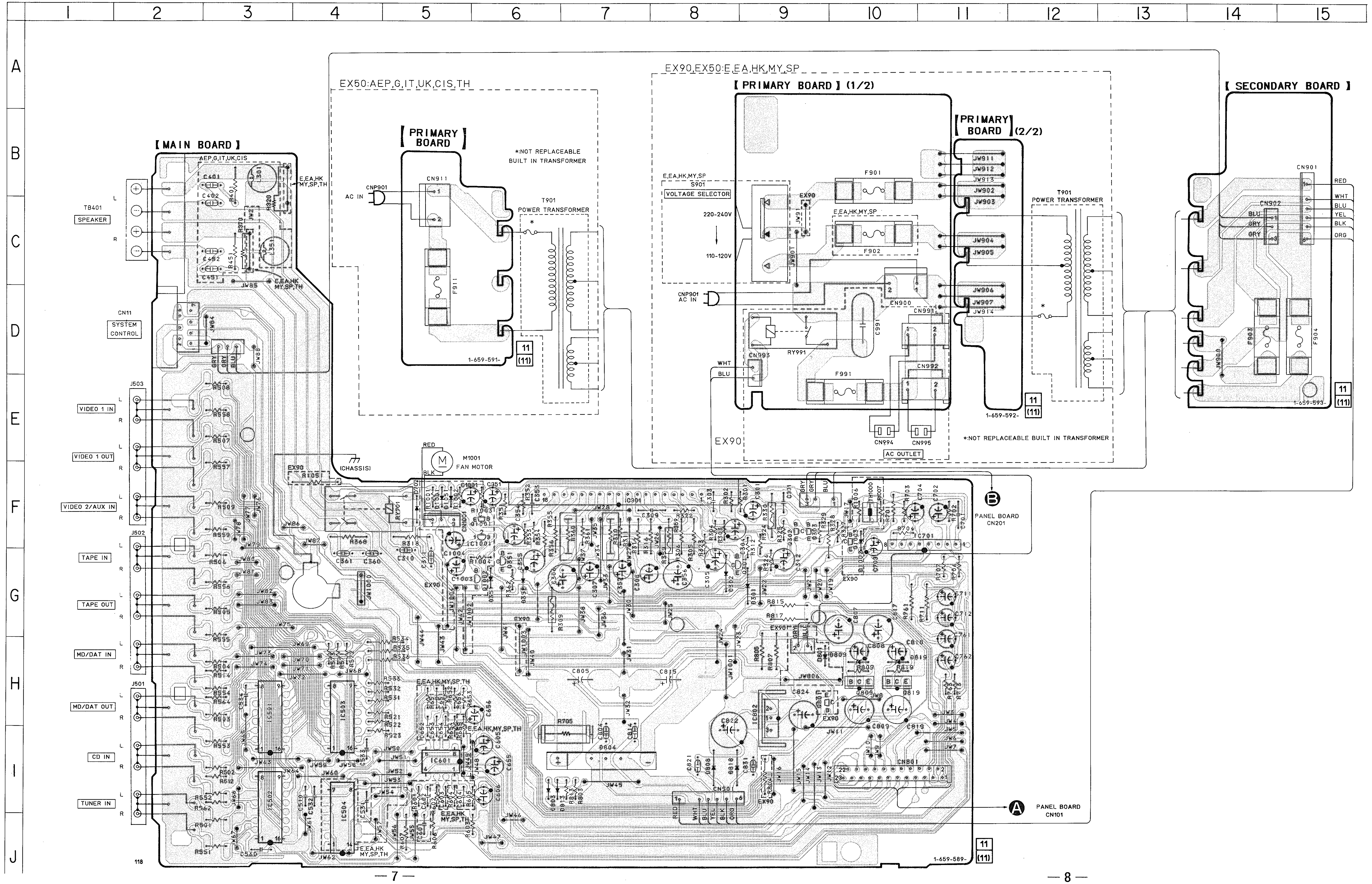
- **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| D301 | G-9 |
| D302 | G-8 |
| D351 | G-6 |
| D352 | G-6 |
| D702 | F-5 |
| D801 | H-9 |
| D803 | I-6 |
| D804 | I-7 |
| D808 | I-8 |
| D809 | H-10 |
| D813 | I-6 |
| D818 | I-8 |
| D819 | H-10 |
| D1001 | F-5 |
| D1002 | F-10 |
| D1051 | F-5 |
| IC301 | F-7 |
| IC501 | H-3 |
| IC502 | I-3 |
| IC503 | H-4 |
| IC504 | I-4 |
| IC601 | I-5 |
| IC701 | F-11 |
| IC802 | H-9 |
| IC1001 | F-6 |
| Q301 | G-8 |
| Q302 | F-9 |
| Q303 | F-9 |
| Q351 | G-6 |
| Q801 | H-9 |
| Q809 | H-10 |
| Q819 | H-10 |
| Q1001 | F-6 |
| Q1002 | G-6 |
| Q1003 | F-10 |

**Note:**

- ▨ : Pattern from the side which enable seeing.
- Abbreviation

G : German model.
IT : Italian model.
EA : Saudi Arabia model.
HK : Hong Kong model.
SP : Singapore model.
MY : Malaysia model.
TH : Thailand model.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
[ MAIN BOARD ]
EX50:AEP,G,IT,UK,CIS,TH
[ PRIMARY BOARD ]
*:NOT REPLACEABLE BUILT IN TRANSFORMER
CNP901
AC IN
CN911
F911
T901
POWER TRANSFORMER
1-659-591-
11
(11)
EX90,EX50:E,EA,HK,MY,SP
[ PRIMARY BOARD ] (1/2)
[ PRIMARY BOARD ] (2/2)
E,EA,HK,MY,SP
S901
VOLTAGE SELECTOR
220-240V
110-120V
EX90
F901
F902
E,EA,HK,MY,SP
JW911
JW912
JW913
JW902
JW903
JW904
JW905
JW906
JW907
JW914
JW908
CNP901
AC IN
CN900
CN991
C991
RY991
CN993
F991
CN992
WHT
BLU
CN994
CN995
AC OUTLET
1-659-592-
*:NOT REPLACEABLE BUILT IN TRANSFORMER
EX90
[ SECONDARY BOARD ]
CN901
CN902
BLU
GRY
GRY
RED
WHT
BLU
YEL
BLK
ORG
F903
F904
1-659-593-
TB401
SPEAKER
L
R
AEP,G,IT,UK,CIS
E,EA,HK MY,SP,TH
CN11
SYSTEM CONTROL
J503
VIDEO 1 IN
VIDEO 1 OUT
VIDEO 2/AUX IN
J502
TAPE IN
TAPE OUT
MD/DAT IN
J501
MD/DAT OUT
CD IN
TUNER IN
(CHASSIS)
RED
M1001
FAN MOTOR
BLK
IC1001
IC301
IC701
IC501
IC503
IC502
IC504
IC601
IC802
CN801
CN501
B
PANEL BOARD CN201
A
PANEL BOARD CN101
E,EA,HK,MY,SP,TH
118
1-659-589-
11
(11)

## 2-4. SCHEMATIC DIAGRAM — MAIN SECTION —

【MAIN BOARD】
·IC BLOCK DIAGRAM
·IC503 MC14052BCP
·IC701 μPC1237HA
OVER LOAD DET
OFFSET DET
LATCH/AUTORESET
AC OFF DET
Vcc ON MUTE
IC501 INPUT SELECTOR
IC502 INPUT SELECTOR
IC503 OUTPUT SELECTOR
IC504 KARAOKE PON SWITCH
IC601 AMP
IC301 POWER AMP
IC701 PROTECTOR
IC802 +5V REG
IC1001 REG
FAN MOTOR
TEMPERATURE DET
Q302, 303 POWER ON/OFF SWITCH
Q801, 351 OVER LOAD DET
RELAY SWITCH
TUNER IN
CD IN
MD/DAT OUT
MD/DAT IN
TAPE OUT
TAPE IN
VIDEO2/AUX IN
VIDEO1 OUT
VIDEO1 IN
J501
J502
J503
TB401 SPEAKER
L
L-GND
R-GND
R
EX50:AEP, G, IT, UK, CIS, TH
【PRIMARY BOARD】
T901 POWER TRANSFORMER
AC IN
∗ NOT REPLACEABLE
: BUILT IN TRANSFORMER
EX90
EX50:E, EA, HK, MY, SP
【PRIMARY BOARD (1/2)】
【PRIMARY BOARD (2/2)】
【SECONDARY BOARD】
VOLTAGE SELECTOR
AC OUTLET
(CHASSIS)
CN11 SYSTEM CONTROL
B VOL BOARD CN201
A PANEL BOARD CN101

### NOTE

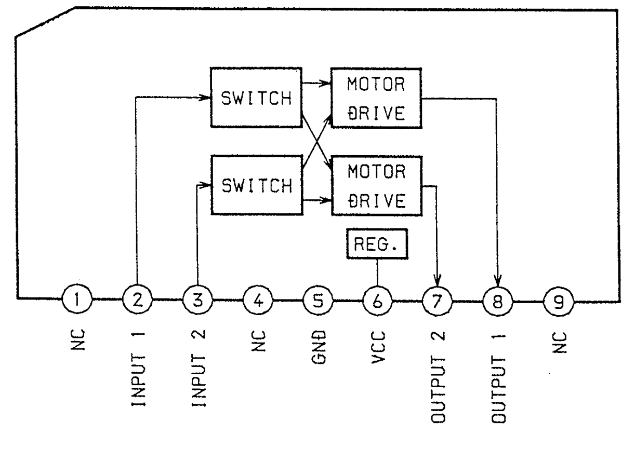
- All capacitors are in μF unless otherwise noted. pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ▭ :nonflammable resistor.
- ▭ :fusible resistor.

Note:The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

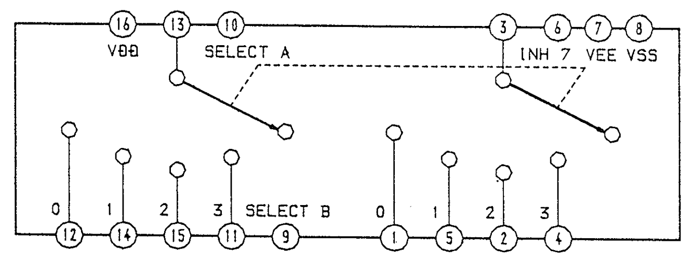
- B+ :B+ Line.
- B− :B− Line.
- ▭ :panel designation.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark:TUNER mode
- Voltages are taken with a VOM (10M Ω/V)
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ :FM
  ▷ :MIC
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  HK: Hong Kong model.
  SP :Singapore model.
  MY :Malaysia model.
  TH :Thailand model.

- IC Block Diagrams

IC104 BA6208

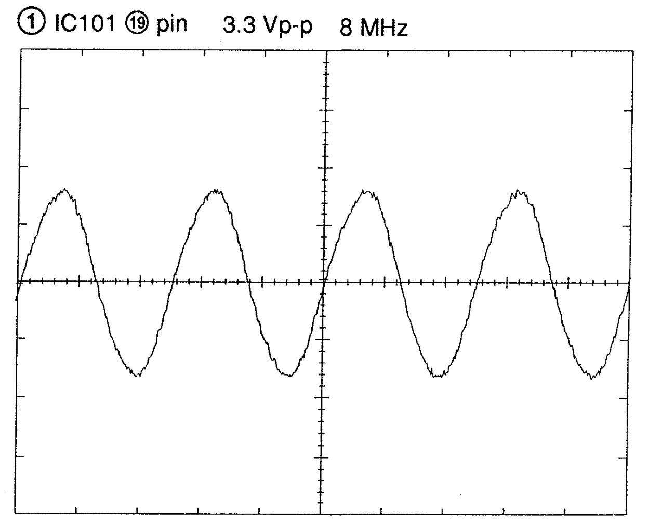

SWITCH
MOTOR DRIVE
SWITCH
MOTOR DRIVE
REG.
NC
INPUT 1
INPUT 2
NC
GND
VCC
OUTPUT 2
OUTPUT 1
NC

IC202 MC14052BCP


VDD
SELECT A
INH
VEE
VSS
SELECT B

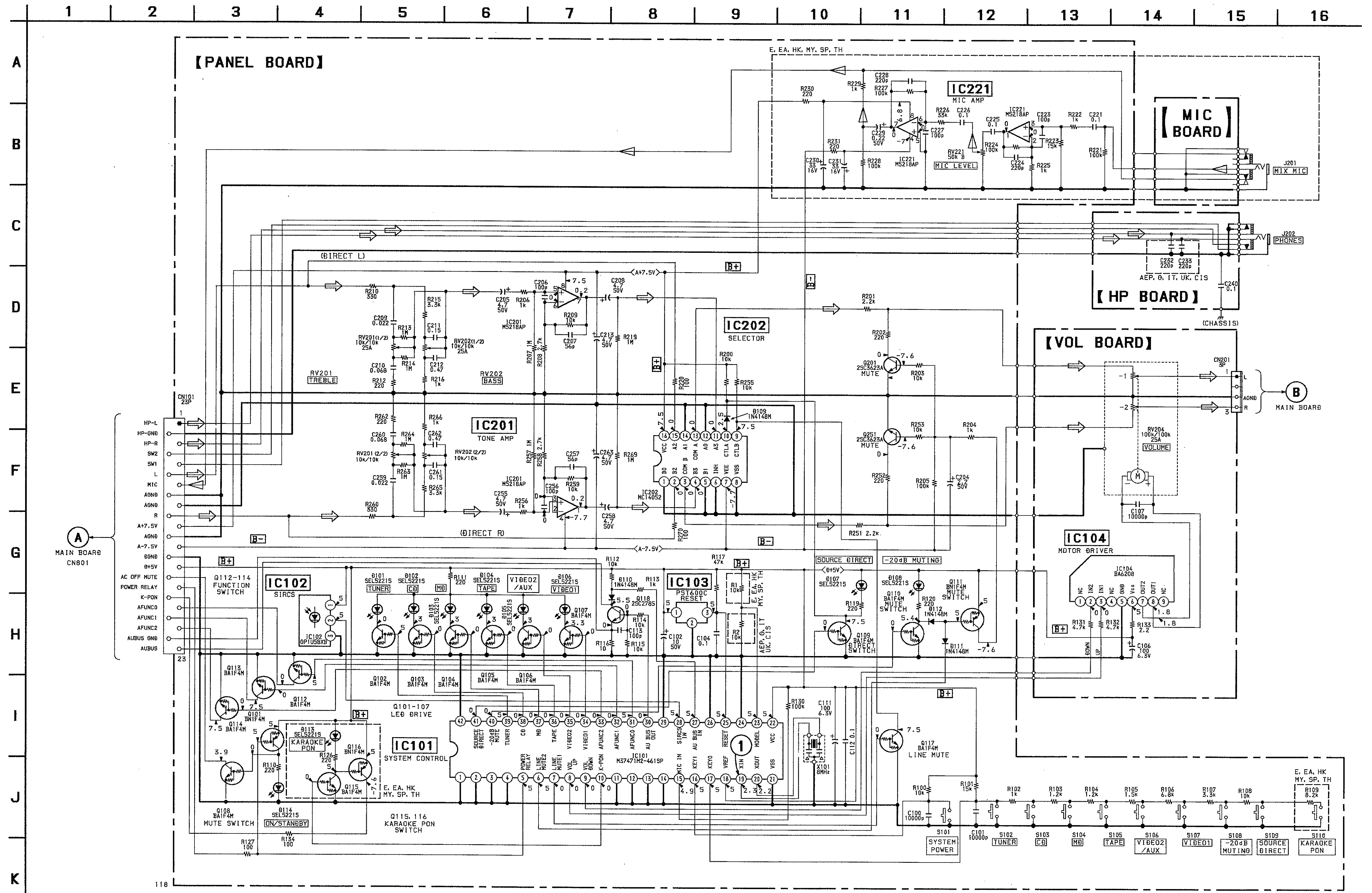
- Waveform

① IC101 ⑲ pin 3.3 Vp-p 8 MHz



## 2-5. SCHEMATIC DIAGRAM — PANEL SECTION —

- See page 5 for IC Pin Function. (IC101)

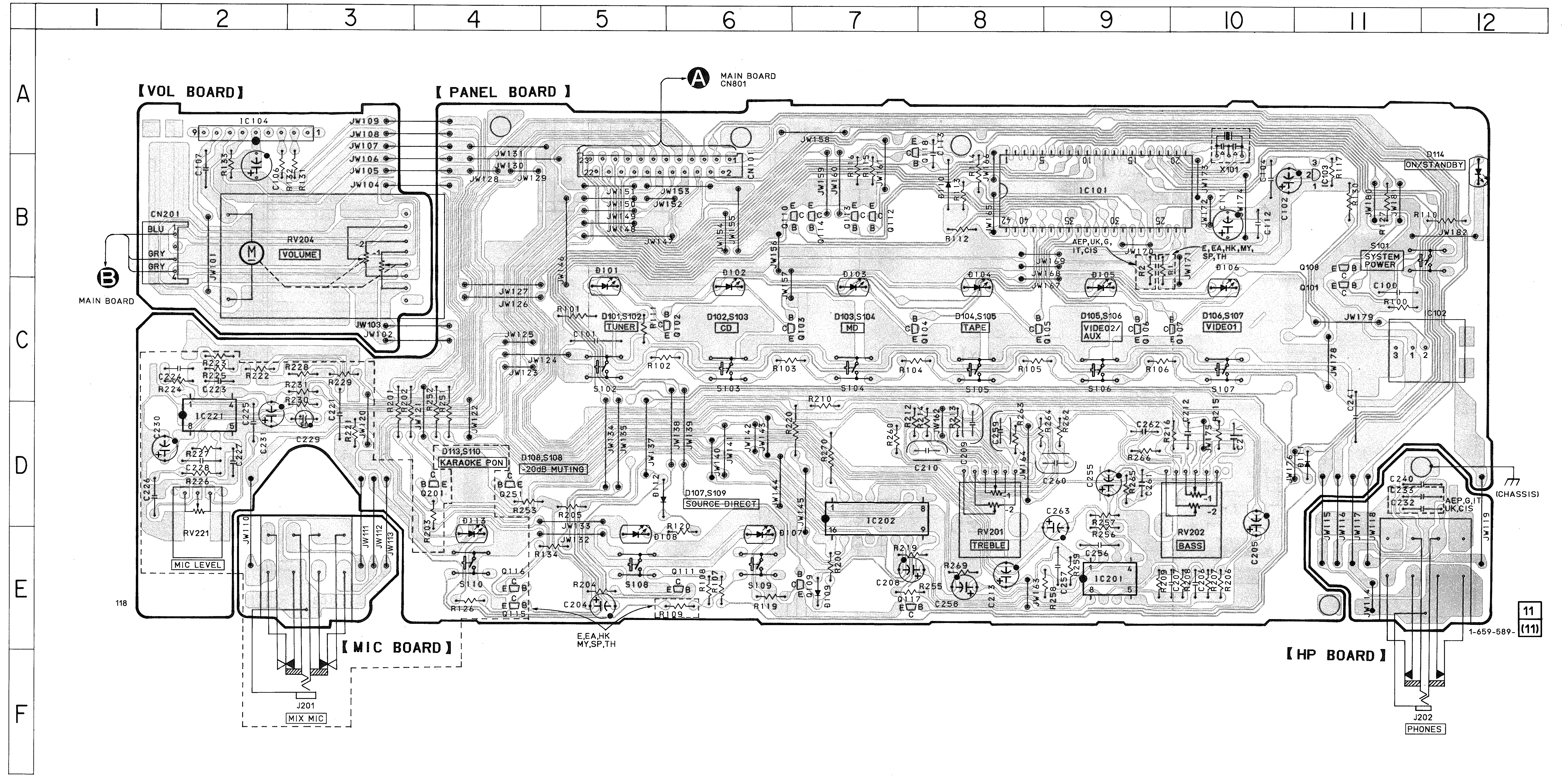

【PANEL BOARD】
【MIC BOARD】
【HP BOARD】
【VOL BOARD】
IC221 MIC AMP
IC202 SELECTOR
IC201 TONE AMP
IC104 MOTOR DRIVER
IC102 RESET
IC103 ANALOG BUFFER
IC101 SYSTEM CONTROL
MAIN BOARD CN601
MAIN BOARD
Q108 MUTE SWITCH
D114 SEL5221S ON/STANDBY
Q115, 116 KARAOKE PON SWITCH
S101 SYSTEM POWER
S102 TUNER
S103 CD
S104 MD
S105 TAPE
S106 VIDEO2 /AUX
S107 VIDEO1
S108 -20dB MUTING
S109 SOURCE DIRECT
S110 KARAOKE PON

**NOTE**

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- B+ :B+ Line.
- B- :B- Line.
- ▭ :panel designation.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark:TUNER mode
- Voltages are taken with a VOM (10MΩ/V).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ▷ :MIC
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  HK :Hong Kong model.
  SP :Singapore model.
  MY :Malaysia model.
  TH :Thailand model.

## 2-6. PRINTED WIRING BOARD — PANEL SECTION —

- See page 4 for Circuit Boards Location.


【VOL BOARD】
【PANEL BOARD】
【MIC BOARD】
【HP BOARD】
MAIN BOARD CN801
MAIN BOARD
RV204 VOLUME
RV201 TREBLE
RV202 BASS
RV221 MIC LEVEL
J201 MIX MIC
J202 PHONES
ON/STANDBY
SYSTEM POWER
TUNER
CD
MD
TAPE
VIDEO2/AUX
VIDEO1
KARAOKE PON
-20dB MUTING
SOURCE DIRECT
(CHASSIS)
11
(11)
1-659-589-

- Semiconductor Location

| Ref. No. | Location |
|---|---|
| D101 | C-5 |
| D102 | C-6 |
| D103 | C-7 |
| D104 | C-8 |
| D105 | C-9 |
| D106 | C-10 |
| D107 | E-6 |
| D108 | E-5 |
| D109 | E-7 |
| D110 | B-8 |
| D111 | D-11 |
| D112 | D-5 |
| D113 | E-4 |
| D114 | B-12 |
| IC101 | B-9 |
| IC102 | C-12 |
| IC103 | B-11 |
| IC104 | A-2 |
| IC201 | E-9 |
| IC202 | D-7 |
| IC221 | D-2 |
| Q101 | C-11 |
| Q102 | C-6 |
| Q103 | C-7 |
| Q104 | C-7 |
| Q105 | C-8 |
| Q106 | C-9 |
| Q107 | C-10 |
| Q108 | B-11 |
| Q109 | E-7 |
| Q110 | B-7 |
| Q111 | E-6 |
| Q112 | B-7 |
| Q113 | B-7 |
| Q114 | B-7 |
| Q115 | E-4 |
| Q116 | E-4 |
| Q117 | E-7 |
| Q118 | A-7 |
| Q201 | D-4 |
| Q251 | D-4 |

**Note:**

- △ : internal component.
- ▨ : Pattern from the side which enable seeing.
- Abbreviation
  G : German model.
  IT : Italian model.
  EA : Saudi Arabia model.
  HK : Hong Kong model.
  SP : Singapore model.
  MY : Malaysia model.
  TH : Thailand model.

# SECTION 3
# EXPLODED VIEWS

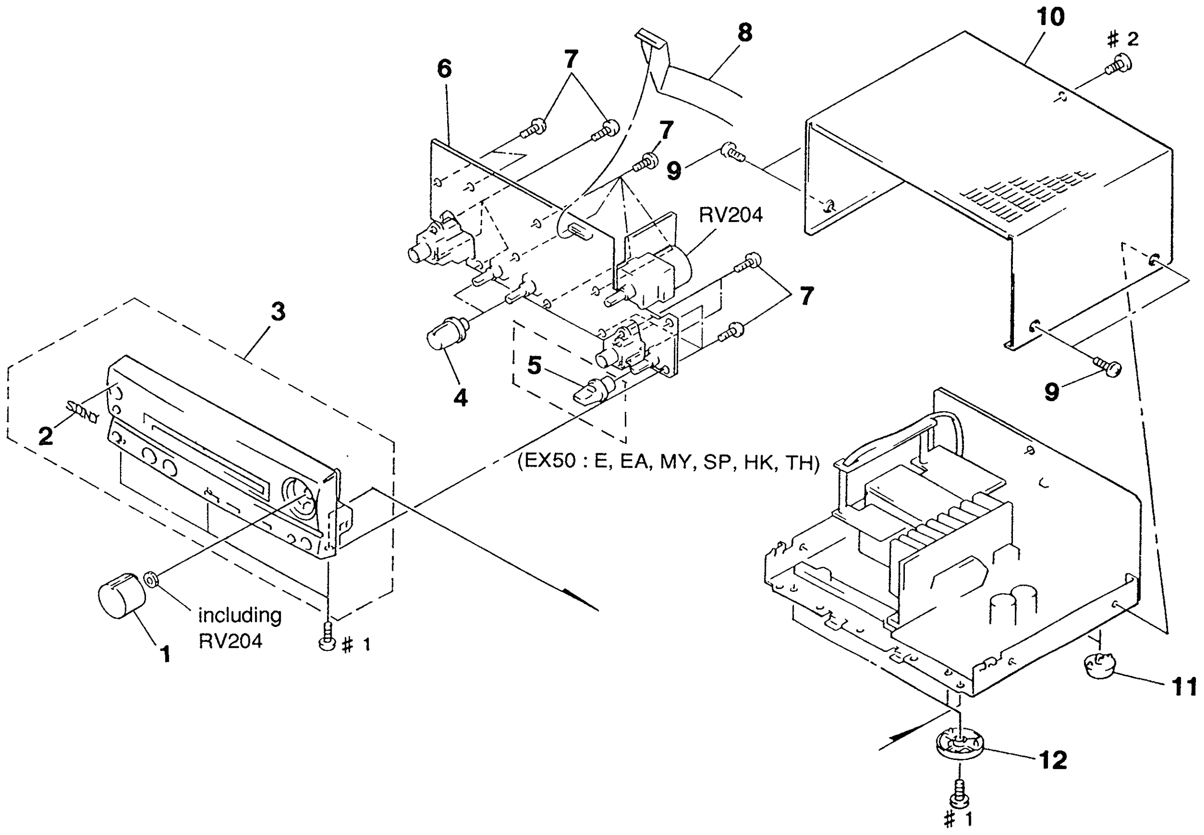
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation

G : German model
IT : Italian model
EA : Saudi Arabia model
HK : Hong Kong model
SP : Singapore model
MY : Malaysia model
TH : Thai model

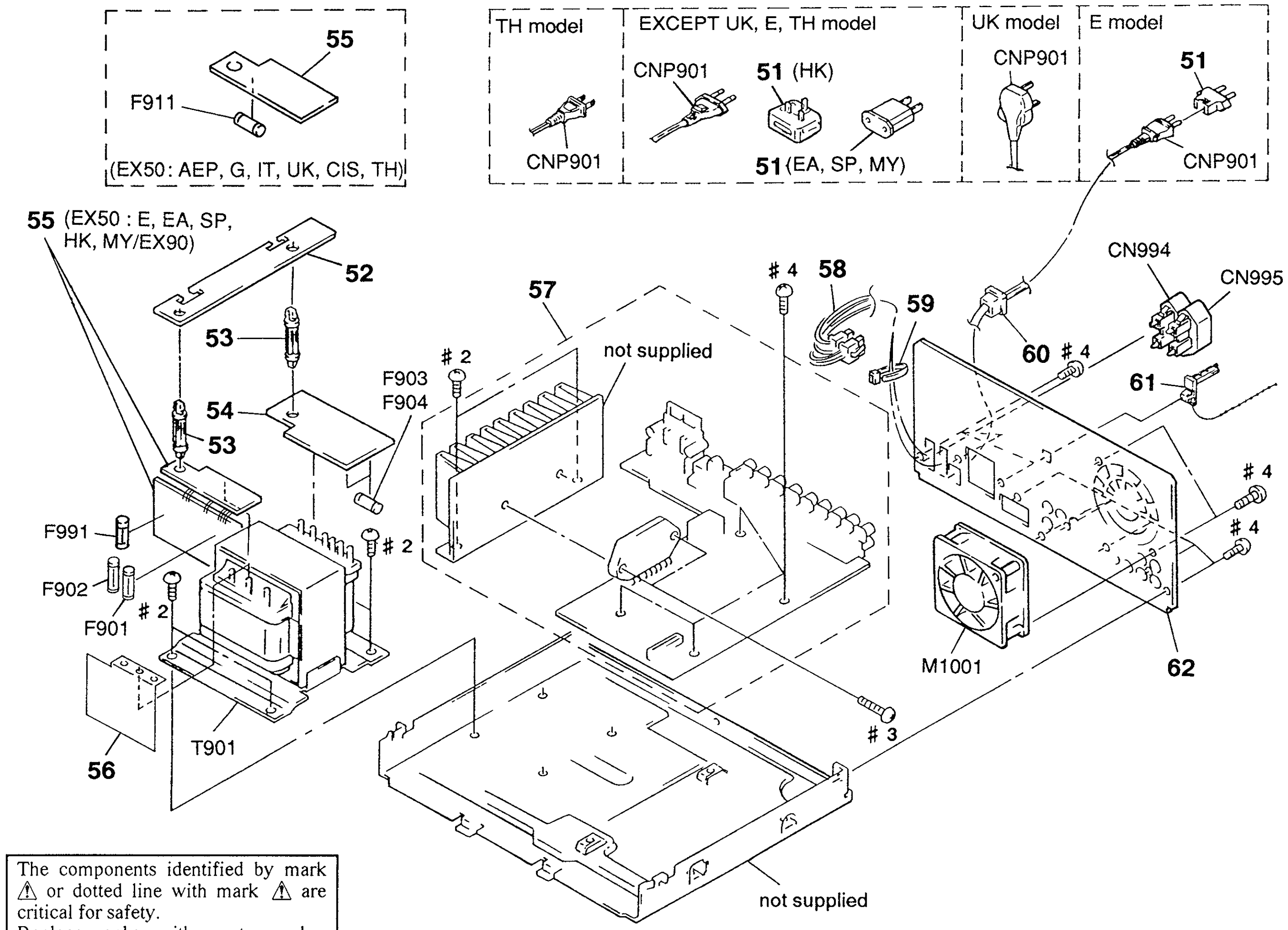
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

## 3-1. FRONT PANEL AND CASE SECTION



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | 4-970-944-21 | KNOB (VOL) (BLACK)... (BLACK) | |
| 1 | 4-970-944-31 | KNOB (VOL) (GRAY)... (SILVER) | |
| 2 | 4-962-708-11 | EMBLEM (4-A), SONY | |
| 3 | X-4946-596-1 | PANEL ASSY (GA), FRONT (GRAY)... (SILVER) (EX50:E, EA, MY, SP, HK) | |
| 3 | X-4946-597-1 | PANEL ASSY (AEP) (S), FRONT (GRAY)... (SILVER) (EX50:AEP, UK, G, IT, CIS) | |
| 3 | X-4946-599-1 | PANEL ASSY (AEP), FRONT (GRAY)... (SILVER) (EX90) | |
| 3 | X-4946-833-1 | PANEL ASSY (AEP) (B), FRONT (BLACK)... (BLACK) (EX50:AEP, UK, G, IT) | |
| 3 | X-4946-954-1 | PANEL ASSY, FRONT (GRAY)... (SILVER) (EX50:TH) | |
| 4 | 4-970-965-21 | KNOB (TONE) (BLACK)... (BLACK) | |
| 4 | 4-970-965-31 | KNOB (TONE) (GRAY)... (SILVER) | |
| 5 | 4-973-043-31 | KNOB (KR) (EX50:E, EA, MY, SP, HK, TH) | |
| * 6 | A-4378-852-A | PANEL BOARD, COMPLETE (EX50:E, EA, MY, SP, HK, TH) | |
| * 6 | A-4378-855-A | PANEL BOARD, COMPLETE (EX90) | |
| * 6 | A-4378-859-A | PANEL BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS) | |
| 7 | 4-951-620-01 | SCREW (2.6X8), +BVTP | |
| 8 | 1-773-187-11 | WIRE (FLAT TYPE) (23 CORE) | |
| 9 | 3-363-099-01 | SCREW (CASE 3 TP2) | |
| 10 | 3-919-558-71 | CASE (BLACK)... (BLACK) (EX50) | |
| 10 | 4-978-245-11 | CASE (GRAY)... (SILVER) | |
| 10 | 4-978-245-31 | CASE (GRAY)... (SILVER) (EX90) | |
| 11 | 4-965-822-01 | FOOT | |
| 12 | 4-977-699-11 | LEG (F) | |
| RV204 | 1-223-811-11 | RES, VAR, CARBON 100K/100K (VOLUME) | |

## 3-2. CHASSIS SECTION



55
F911
(EX50: AEP, G, IT, UK, CIS, TH)
TH model
CNP901
EXCEPT UK, E, TH model
CNP901
51 (HK)
51 (EA, SP, MY)
UK model
CNP901
E model
51
CNP901
55 (EX50 : E, EA, SP, HK, MY/EX90)
52
53
54
53
F991
F902
F901
# 2
T901
56
F903
F904
# 2
# 2
57
not supplied
# 4
58
59
CN994
CN995
60
# 4
61
# 4
# 4
M1001
62
# 3
not supplied

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠51 | 1-569-007-11 | ADAPTER, CONVERSION 2P (EX50:E) | |
| ⚠51 | 1-569-008-11 | ADAPTER, CONVERSION 2P (EX50:EA, MY, SP) | |
| ⚠51 | 1-770-019-11 | ADAPTOR, CONVERSION PLUG 3P (EX50:HK) | |
| * 52 | 1-659-594-11 | COVER BOARD | |
| * 53 | 4-385-948-01 | HOLDER, PCB | |
| * 54 | 1-659-593-11 | SECONDARY BOARD | |
| * 55 | 1-659-591-11 | PRIMARY BOARD (EX50:AEP, UK, G, IT, CIS, TH) | |
| * 55 | 1-659-592-11 | PRIMARY BOARD (EX50:E, EA, HK, MY, SP/EX90) | |
| * 56 | 4-978-612-02 | SHEET, INSULATING | |
| * 57 | A-4364-898-A | MAIN ASSY BOARD, COMPLETE (EX50:TH) | |
| * 57 | A-4378-853-A | MAIN BOARD, COMPLETE (EX50:E, EA, MY, SP, HK, TH) | |
| * 57 | A-4378-856-A | MAIN BOARD, COMPLETE (EX90) | |
| * 57 | A-4378-860-A | MAIN BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS) | |
| 58 | 1-776-429-11 | CORD (WITH CONNECTOR)(EX90) | |
| 59 | 3-655-653-01 | BAND (TAITON), BINDING (EX90:UK) | |
| * 60 | 3-703-244-00 | BUSHING (2104), CORD (EX50:AEP, UK, G, IT, CIS, EA, MY, SP, HK/EX90) | |
| 60 | 3-703-571-11 | BUSHING (S)(4516), CORD (EX50:E, TH) | |
| 61 | 4-956-370-02 | BAND, PLUG FIXED (EX50:UK, HK/EX90:UK) | |
| * 62 | 4-978-966-01 | PANEL, BACK (EX50:E, MY, SP) | |
| * 62 | 4-978-966-11 | PANEL, BACK (EX50:HK) | |
| * 62 | 4-978-966-31 | PANEL, BACK (EX50:EA) | |
| * 62 | 4-978-966-41 | PANEL, BACK (EX50:TH) | |
| * 62 | 4-978-969-01 | PANEL, BACK (EX50:AEP) | |
| * 62 | 4-978-969-11 | PANEL, BACK (EX50:G) | |
| * 62 | 4-978-969-21 | PANEL, BACK (EX50:IT) | |
| * 62 | 4-978-969-31 | PANEL, BACK (EX50:UK) | |
| * 62 | 4-978-969-51 | PANEL, BACK (EX50:CIS) | |
| * 62 | 4-978-974-01 | PANEL, BACK (EX90:AEP) | |
| * 62 | 4-978-974-21 | PANEL, BACK (EX90:IT) | |
| * 62 | 4-978-974-31 | PANEL, BACK (EX90:UK) | |
| ⚠CN994 | 1-526-794-11 | OUTLET, AC (AC OUTLET)(EX90) | |
| ⚠CN995 | 1-526-794-11 | OUTLET, AC (AC OUTLET)(EX90) | |
| ⚠CNP901 | 1-575-651-11 | CORD, POWER (EX50:AEP, G, IT, CIS, EA, MY, SP, HK/EX90:AEP, IT) | |
| ⚠CNP901 | 1-575-653-11 | CORD, POWER (EX50:E) | |
| ⚠CNP901 | 1-751-326-31 | CORD, POWER (EX50:TH) | |
| ⚠CNP901 | 1-751-520-21 | CORD, POWER (EX50:UK/EX90:UK) | |
| ⚠F901 | 1-532-078-00 | FUSE, TIME LAG (T1.0AL, 250V) (EX50:E, EA, MY, SP, HK, TH) | |
| ⚠F901 | 1-532-285-00 | FUSE, TIME LAG (T1.25AL, 250V)(EX90) | |
| ⚠F902 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V) (EX50:E, EA, MY, SP, HK) | |
| ⚠F903 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V) | |
| ⚠F904 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V) | |
| ⚠F911 | 1-532-078-00 | FUSE, TIME LAG (T1.0AL, 250V)(EX50:TH) | |
| ⚠F911 | 1-532-285-00 | FUSE, TIME LAG (T1.25AL, 250V) (EX50:AEP, UK, G, IT, CIS) | |
| ⚠F991 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V)(EX90) | |
| ⚠M1001 | 1-698-720-11 | MOTOR, FAN (DC)(EX90) | |
| ⚠T901 | 1-429-311-11 | TRANSFORMER, POWER (EX50:E, EA, MY, SP, HK, TH) | |
| ⚠T901 | 1-429-312-11 | TRANSFORMER, POWER(EX90) | |
| ⚠T901 | 1-429-484-11 | TRANSFORMER, POWER(EX50:AEP, UK, G, IT, CIS) | |

# SECTION 4
# ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- COILS
  uH : μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  HK : Hong Kong model
  SP : Singapore model
  MY : Malaysia model
  TH : Thailand model

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| * | 1-659-594-11 | COVER BOARD | | | | |
| | | *********** | | | | |
| ************************************************************** | | | | | | |
| * | A-4378-853-A | MAIN BOARD, COMPLETE | | | | (EX50:E, EA, HK, MY, SP, TH) |
| | | **************************************** | | | | |
| * | A-4378-856-A | MAIN BOARD, COMPLETE (EX90) | | | | |
| | | *************************** | | | | |
| * | A-4378-860-A | MAIN BOARD, COMPLETE | | | | (EX50:AEP, UK, G, IT, CIS) |
| | | **************************************** | | | | |
| | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | | | | |
| | | < CAPACITOR > | | | | |
| C301 | 1-126-961-11 | ELECT | 2. 2uF | 20% | 50V | |
| C303 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C304 | 1-124-910-11 | ELECT | 47uF | 20% | 50V | |
| C305 | 1-124-910-11 | ELECT | 47uF | 20% | 50V | |
| C306 | 1-124-122-11 | ELECT | 100uF | 20% | 50V | |
| C307 | 1-124-907-11 | ELECT | 10uF | 20% | 50V | |
| C308 | 1-126-965-11 | ELECT | 22uF | 20% | 50V | |
| C309 | 1-164-159-11 | CERAMIC | 0. 1uF | | 50V | |
| C310 | 1-136-163-00 | FILM | 0. 068uF | 5% | 50V | |
| C311 | 1-136-163-00 | FILM | 0. 068uF | 5% | 50V | |
| C312 | 1-124-910-11 | ELECT | 47uF | 20% | 50V | |
| C351 | 1-126-961-11 | ELECT | 2. 2uF | 20% | 50V | |
| C353 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C354 | 1-124-910-11 | ELECT | 47uF | 20% | 50V | |
| C355 | 1-124-910-11 | ELECT | 47uF | 20% | 50V | |
| C356 | 1-124-122-11 | ELECT | 100uF | 20% | 50V | |
| C357 | 1-124-907-11 | ELECT | 10uF | 20% | 50V | |
| C360 | 1-136-163-00 | FILM | 0. 068uF | 5% | 50V | |
| C361 | 1-136-163-00 | FILM | 0. 068uF | 5% | 50V | |
| C401 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | (EX50:AEP, UK, G, IT, CIS/EX90) |
| C402 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | (EX50:AEP, UK, G, IT, CIS/EX90) |
| C451 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | (EX50:AEP, UK, G, IT, CIS/EX90) |
| C452 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | (EX50:AEP, UK, G, IT, CIS/EX90) |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C510 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C531 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | |
| C532 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | |
| C533 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | |
| C534 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | |
| C560 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C601 | 1-162-294-31 | CERAMIC | 0. 001uF | 10% | 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C602 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | (EX50:E, EA, HK, MY, SP, TH) |
| C603 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C604 | 1-162-215-31 | CERAMIC | 47PF | 5% | 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C605 | 1-104-664-11 | ELECT | 47uF | 20% | 16V | |
| C606 | 1-124-907-11 | ELECT | 10uF | 20% | 50V | |
| C651 | 1-162-294-31 | CERAMIC | 0. 001uF | 10% | 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C652 | 1-162-306-11 | CERAMIC | 0. 01uF | 30% | 16V | (EX50:E, EA, HK, MY, SP, TH) |
| C653 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C654 | 1-162-215-31 | CERAMIC | 47PF | 5% | 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C655 | 1-104-664-11 | ELECT | 47uF | 20% | 16V | |
| C656 | 1-124-907-11 | ELECT | 10uF | 20% | 50V | |
| C701 | 1-162-294-31 | CERAMIC | 0. 001uF | 10% | 50V | |
| C702 | 1-124-443-00 | ELECT | 100uF | 20% | 10V | |
| C703 | 1-126-961-11 | ELECT | 2. 2uF | 20% | 50V | |
| C704 | 1-124-443-00 | ELECT | 100uF | 20% | 10V | |
| C711 | 1-126-965-11 | ELECT | 22uF | 20% | 50V | |
| C712 | 1-126-965-11 | ELECT | 22uF | 20% | 50V | |
| C761 | 1-126-965-11 | ELECT | 22uF | 20% | 50V | |
| C762 | 1-126-965-11 | ELECT | 22uF | 20% | 50V | |
| C804 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | |
| C805 | 1-126-138-11 | ELECT | 4700uF | 20% | 50V | |
| C807 | 1-126-968-11 | ELECT | 100uF | 20% | 35V | |
| C808 | 1-124-443-00 | ELECT | 100uF | 20% | 10V | |
| C809 | 1-124-472-11 | ELECT | 470uF | 20% | 10V | |
| C814 | 1-136-165-00 | FILM | 0. 1uF | 5% | 50V | |
| C815 | 1-126-138-11 | ELECT | 4700uF | 20% | 50V | |
| C817 | 1-126-968-11 | ELECT | 100uF | 20% | 35V | |
| C818 | 1-124-443-00 | ELECT | 100uF | 20% | 10V | |
| C819 | 1-124-472-11 | ELECT | 470uF | 20% | 10V | |

# MAIN

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| C821 | 1-136-153-00 | FILM 0.01uF 5% 50V | |
| C822 | 1-126-952-11 | ELECT 1000uF 20% 16V | |
| C824 | 1-124-472-11 | ELECT 470uF 20% 10V | |
| C831 | 1-136-153-00 | FILM 0.01uF 5% 50V | |
| C1001 | 1-124-907-11 | ELECT 10uF 20% 50V | (EX90) |
| C1003 | 1-126-096-11 | ELECT 10uF 20% 35V | (EX90) |
| C1004 | 1-126-096-11 | ELECT 10uF 20% 35V | (EX90) |
| | | < CONNECTOR > | |
| CN11 | 1-770-158-21 | HOUSING, CONNECTOR 7P (SYSTEM CONTROL) | |
| CN501 | 1-770-966-11 | PIN, CONNECTOR (PCB)(V TYPE)6P | |
| * CN801 | 1-568-839-11 | SOCKET, CONNECTOR 23P | |
| CN1001 | 1-564-506-11 | PLUG, CONNECTOR 3P (EX90) | |
| | | < DIODE > | |
| D301 | 8-719-987-63 | DIODE 1N4148M | |
| D302 | 8-719-987-63 | DIODE 1N4148M | |
| D351 | 8-719-987-63 | DIODE 1N4148M | |
| D352 | 8-719-987-63 | DIODE 1N4148M | |
| D702 | 8-719-987-63 | DIODE 1N4148M | |
| D801 | 8-719-987-63 | DIODE 1N4148M (EX90) | |
| D803 | 8-719-987-63 | DIODE 1N4148M | |
| D804 | 8-719-510-68 | DIODE D5SBA20F01 | |
| D808 | 8-719-024-99 | DIODE 11ES2-NTA2B | |
| D809 | 8-719-933-54 | DIODE HZS9A2L | |
| D813 | 8-719-987-63 | DIODE 1N4148M | |
| D818 | 8-719-024-99 | DIODE 11ES2-NTA2B | |
| D819 | 8-719-933-54 | DIODE HZS9A2L | |
| D1001 | 8-719-987-63 | DIODE 1N4148M (EX90) | |
| D1002 | 8-719-987-63 | DIODE 1N4148M (EX90) | |
| D1051 | 8-719-987-63 | DIODE 1N4148M (EX90) | |
| | | < IC > | |
| IC301 | 8-749-900-24 | IC STK-4162MK2 (EX50) | |
| IC301 | 8-749-920-10 | IC STK4172MK2 (EX90) | |
| IC501 | 8-759-000-47 | IC MC14051BCP | |
| IC502 | 8-759-000-47 | IC MC14051BCP | |
| IC503 | 8-759-000-48 | IC MC14052BCP | |
| IC504 | 8-759-000-49 | IC MC14066BCP (EX50:E, EA, HK, MY, SP, TH) | |
| IC601 | 8-759-710-59 | IC NJM4580D-D | |
| IC701 | 8-759-111-68 | IC UPC1237HA | |
| IC802 | 8-759-231-53 | IC TA7805S | |
| IC1001 | 8-759-377-68 | IC TA78L007AP-TPE6 (EX90) | |
| | | < JACK > | |
| J501 | 1-770-015-11 | JACK, PIN 6P(TUNER IN, CD IN, MD/DAT OUT) | |
| J502 | 1-770-015-11 | JACK, PIN 6P(MD/DAT IN, TAPE OUT, TAPE IN) | |
| J503 | 1-770-015-11 | JACK, PIN 6P (VIDEO2/AUX IN, VIDEO1 OUT, VIDEO1 IN) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < COIL > | |
| L301 | 1-420-872-00 | COIL, AIR-CORE | (EX50:AEP, UK, G, IT, CIS/EX90) |
| L351 | 1-420-872-00 | COIL, AIR-CORE | (EX50:AEP, UK, G, IT, CIS/EX90) |
| | | < TRANSISTOR > | |
| Q301 | 8-729-140-82 | TRANSISTOR 2SA988-PAFAEA | |
| Q302 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q303 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q351 | 8-729-140-82 | TRANSISTOR 2SA988-PAFAEA | |
| Q801 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE (EX90) | |
| Q809 | 8-729-140-96 | TRANSISTOR 2SD774-34 | |
| Q819 | 8-729-140-97 | TRANSISTOR 2SB734-34 | |
| Q1001 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE (EX90) | |
| Q1002 | 8-729-118-00 | TRANSISTOR 2SB1116-L (EX90) | |
| Q1003 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE (EX90) | |
| | | < RESISTOR > | |
| R301 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R302 | 1-249-438-11 | CARBON 56K 5% 1/4W | |
| R303 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R304 | 1-249-438-11 | CARBON 56K 5% 1/4W | |
| R305 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| R306 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| ⚠R309 | 1-212-881-11 | FUSIBLE 100 5% 1/4W | F |
| ⚠R310 | 1-217-151-00 | METAL PLATE 0.22 10% 2W | F |
| R311 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R312 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R314 | 1-260-099-11 | CARBON 1K 5% 1/2W | |
| R316 | 1-260-099-11 | CARBON 1K 5% 1/2W | |
| R318 | 1-260-076-11 | CARBON 10 5% 1/2W | |
| R320 | 1-260-076-11 | CARBON 10 5% 1/2W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R322 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R323 | 1-247-881-00 | CARBON 120K 5% 1/4W | |
| R324 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R325 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R326 | 1-249-439-11 | CARBON 68K 5% 1/4W | |
| R327 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R328 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | |
| R329 | 1-249-433-11 | CARBON 22K 5% 1/4W | |
| ⚠R330 | 1-212-849-00 | FUSIBLE 4.7 5% 1/4W | F |
| R351 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R352 | 1-249-438-11 | CARBON 56K 5% 1/4W | |
| R353 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R354 | 1-249-438-11 | CARBON 56K 5% 1/4W | |
| R355 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| R356 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| ⚠R359 | 1-212-881-11 | FUSIBLE 100 5% 1/4W | F |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠R360 | 1-217-151-00 | METAL PLATE 0.22 10% 2W | F |
| R361 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R362 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R368 | 1-260-076-11 | CARBON 10 5% 1/2W | |
| R370 | 1-260-076-11 | CARBON 10 5% 1/2W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R401 | 1-260-076-11 | CARBON 10 5% 1/2W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R451 | 1-260-076-11 | CARBON 10 5% 1/2W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R501 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R502 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R503 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R504 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R505 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R506 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R507 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R508 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R509 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R512 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R514 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R521 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R522 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R523 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R531 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R532 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R533 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R534 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R535 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R536 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R551 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R552 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R553 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R554 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R555 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R556 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R557 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R558 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R559 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R562 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R564 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R571 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R572 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R573 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R601 | 1-249-437-11 | CARBON 47K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R602 | 1-249-437-11 | CARBON 47K 5% 1/4W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R602 | 1-249-434-11 | CARBON 27K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R603 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R604 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R605 | 1-249-437-11 | CARBON 47K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R606 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R607 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R651 | 1-249-437-11 | CARBON 47K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R652 | 1-249-437-11 | CARBON 47K 5% 1/4W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R652 | 1-249-434-11 | CARBON 27K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R653 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R654 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R655 | 1-249-437-11 | CARBON 47K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R656 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R701 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R702 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R703 | 1-249-430-11 | CARBON 12K 5% 1/4W | |
| R704 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| ⚠R705 | 1-215-890-11 | METAL OXIDE 470 5% 2W | F |
| R706 | 1-249-438-11 | CARBON 56K 5% 1/4W | |
| R707 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R711 | 1-260-095-11 | CARBON 470 5% 1/2W | |
| R713 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R761 | 1-260-095-11 | CARBON 470 5% 1/2W | |
| R763 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R803 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R804 | 1-249-417-11 | CARBON 1K 5% 1/4W | (EX90) |
| R805 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| R807 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| R809 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R813 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R815 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| R817 | 1-260-103-11 | CARBON 2.2K 5% 1/2W | |
| R819 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R1001 | 1-249-433-11 | CARBON 22K 5% 1/4W | (EX90) |
| R1002 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX90) |
| R1003 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX90) |
| R1004 | 1-249-429-11 | CARBON 10K 5% 1/4W | (EX90) |
| R1006 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX90) |
| R1007 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX90) |
| R1051 | 1-249-433-11 | CARBON 22K 5% 1/4W | (EX90) |
| | | < RELAY > | |
| RY701 | 1-515-920-11 | RELAY (24V) | |
| | | < TERMINAL > | |
| TB401 | 1-537-240-11 | TERMINAL BOARD (CHECKER PIN)(SPEAKER) | |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

# MAIN PANEL

Consisting the following section in the panel. (HP, MIC, VOL)

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < THERMISTOR > | |
| TH1001 | 1-807-796-11 | THERMISTOR (EX90) | |
| ************************************************************ | | | |
| * | A-4378-852-A | PANEL BOARD, COMPLETE | (EX50:E, EA, HK, MY, SP, TH) |
| | | ************************************** | |
| * | A-4378-855-A | PANEL BOARD, COMPLETE (EX90) | |
| | | **************************** | |
| * | A-4378-859-A | PANEL BOARD, COMPLETE | (EX50:AEP, UK, G, IT, CIS) |
| | | ************************************** | |
| | | | (Including HP, MIC, VOL BOARD) |
| | 1-690-880-11 | LEAD (WITH CONNECTOR) | |
| | | < CAPACITOR > | |
| C100 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C101 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C102 | 1-124-907-11 | ELECT 10uF 20% 50V | |
| C104 | 1-164-159-11 | CERAMIC 0.1uF 50V | |
| C106 | 1-126-968-11 | ELECT 100uF 20% 6.3V | |
| C107 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C111 | 1-126-968-11 | ELECT 100uF 20% 6.3V | |
| C112 | 1-164-159-11 | CERAMIC 0.1uF 50V | |
| C113 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C204 | 1-124-257-00 | ELECT 2.2uF 20% 50V | |
| C205 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C206 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C207 | 1-162-217-31 | CERAMIC 56PF 5% 50V | |
| C208 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C209 | 1-136-157-00 | FILM 0.022uF 5% 50V | |
| C210 | 1-136-163-00 | FILM 0.068uF 5% 50V | |
| C211 | 1-136-167-00 | FILM 0.15uF 5% 50V | |
| C212 | 1-136-173-00 | FILM 0.47uF 5% 50V | |
| C213 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C221 | 1-164-159-11 | CERAMIC 0.1uF 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C223 | 1-162-282-31 | CERAMIC 100PF 10% 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C224 | 1-162-286-31 | CERAMIC 220PF 10% 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C225 | 1-164-159-11 | CERAMIC 0.1uF 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C226 | 1-164-159-11 | CERAMIC 0.1uF 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C227 | 1-162-282-31 | CERAMIC 100PF 10% 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C228 | 1-162-286-31 | CERAMIC 220PF 10% 50V | (EX50:E, EA, HK, MY, SP, TH) |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| C229 | 1-124-464-11 | ELECT 0.22uF 20% 50V | (EX50:E, EA, HK, MY, SP, TH) |
| C230 | 1-104-663-11 | ELECT 33uF 20% 16V | (EX50:E, EA, HK, MY, SP, TH) |
| C231 | 1-104-663-11 | ELECT 33uF 20% 16V | (EX50:E, EA, HK, MY, SP, TH) |
| C232 | 1-162-286-31 | CERAMIC 220PF 10% 50V | (EX50:AEP, UK, G, IT, CIS/EX90) |
| C233 | 1-162-286-31 | CERAMIC 220PF 10% 50V | (EX50:AEP, UK, G, IT, CIS/EX90) |
| C240 | 1-164-159-11 | CERAMIC 0.1uF 50V | |
| C255 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C256 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| C257 | 1-162-217-31 | CERAMIC 56PF 5% 50V | |
| C258 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| C259 | 1-136-157-00 | FILM 0.022uF 5% 50V | |
| C260 | 1-136-163-00 | FILM 0.068uF 5% 50V | |
| C261 | 1-136-167-00 | FILM 0.15uF 5% 50V | |
| C262 | 1-136-173-00 | FILM 0.47uF 5% 50V | |
| C263 | 1-126-963-11 | ELECT 4.7uF 20% 50V | |
| | | < CONNECTOR > | |
| * CN101 | 1-568-839-11 | SOCKET, CONNECTOR 23P | |
| CN201 | 1-764-341-11 | PIN, CONNECTOR (PCB) (L TYPE) 4P | |
| | | < DIODE > | |
| D101 | 8-719-046-44 | DIODE SEL5221S (TUNER) | |
| D102 | 8-719-046-44 | DIODE SEL5221S (CD) | |
| D103 | 8-719-046-44 | DIODE SEL5221S (MD) | |
| D104 | 8-719-046-44 | DIODE SEL5221S (TAPE) | |
| D105 | 8-719-046-44 | DIODE SEL5221S (VIDEO2/AUX) | |
| D106 | 8-719-046-44 | DIODE SEL5221S (VIDEO1) | |
| D107 | 8-719-046-44 | DIODE SEL5221S (SOURCE DIRECT) | |
| D108 | 8-719-046-44 | DIODE SEL5221S (-20dB MUTING) | |
| D109 | 8-719-987-63 | DIODE 1N4148M | |
| D110 | 8-719-987-63 | DIODE 1N4148M | |
| D111 | 8-719-987-63 | DIODE 1N4148M | |
| D112 | 8-719-987-63 | DIODE 1N4148M | |
| D113 | 8-719-046-44 | DIODE SEL5221S (KARAOKE PON) | (EX50:E, EA, HK, MY, SP, TH) |
| D114 | 8-719-046-44 | DIODE SEL5221S (ON/STANDBY) | |
| | | < IC > | |
| IC101 | 8-759-386-85 | IC M37471M2-S1 | |
| IC102 | 8-749-923-11 | IC GP1U58XB (R) | |
| IC103 | 8-759-165-80 | IC PST600C-T | |
| IC104 | 8-759-962-08 | IC BA6208 | |
| IC201 | 8-759-634-51 | IC M5218AP | |
| IC202 | 8-759-000-48 | IC MC14052BCP | |
| IC221 | 8-759-634-51 | IC M5218AP (EX50:E, EA, HK, MY, SP, TH) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < JACK > | |
| J201 | 1-507-854-00 | JACK, PHONE (MIX MIC) | (EX50:E, EA, HK, MY, SP, TH) |
| J202 | 1-507-854-00 | JACK, PHONE (PHONES) | |
| | | < TRANSISTOR > | |
| Q101 | 8-729-900-63 | TRANSISTOR DTA124ES | |
| Q102 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q103 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q104 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q105 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q106 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q107 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q108 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q109 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q110 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q111 | 8-729-900-63 | TRANSISTOR DTA124ES | |
| Q112 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q113 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q114 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q115 | 8-729-900-36 | TRANSISTOR DTC124ES | (EX50:E, EA, HK, MY, SP, TH) |
| Q116 | 8-729-900-63 | TRANSISTOR DTA124ES | (EX50:E, EA, HK, MY, SP, TH) |
| Q117 | 8-729-900-36 | TRANSISTOR DTC124ES | |
| Q118 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q201 | 8-729-141-30 | TRANSISTOR 2SC3623A-LK | |
| Q251 | 8-729-141-30 | TRANSISTOR 2SC3623A-LK | |
| | | < RESISTOR > | |
| R1 | 1-249-429-11 | CARBON 10K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R2 | 1-249-429-11 | CARBON 10K 5% 1/4W | (EX50:AEP, UK, G, IT, CIS/EX90) |
| R100 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R101 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R102 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R103 | 1-249-418-11 | CARBON 1.2K 5% 1/4W | |
| R104 | 1-249-418-11 | CARBON 1.2K 5% 1/4W | |
| R105 | 1-249-419-11 | CARBON 1.5K 5% 1/4W | |
| R106 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | |
| R107 | 1-249-423-11 | CARBON 3.3K 5% 1/4W | |
| R108 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R109 | 1-249-428-11 | CARBON 8.2K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R110 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R111 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R112 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R113 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R114 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R115 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R116 | 1-249-393-11 | CARBON 10 5% 1/4W | |
| R117 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R119 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R120 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R126 | 1-249-409-11 | CARBON 220 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R127 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R130 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R131 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R132 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R133 | 1-249-385-11 | CARBON 2.2 5% 1/6W | |
| R134 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R200 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R201 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R202 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R203 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R204 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R205 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R206 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R207 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R208 | 1-249-422-11 | CARBON 2.7K 5% 1/4W | |
| R209 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R210 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R212 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R213 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R214 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R215 | 1-249-423-11 | CARBON 3.3K 5% 1/4W | |
| R216 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R219 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R220 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R221 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R222 | 1-249-417-11 | CARBON 1K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R223 | 1-249-431-11 | CARBON 15K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R224 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R225 | 1-249-417-11 | CARBON 1K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R226 | 1-249-435-11 | CARBON 33K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R227 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R228 | 1-249-441-11 | CARBON 100K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R229 | 1-249-417-11 | CARBON 1K 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R230 | 1-249-409-11 | CARBON 220 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |
| R231 | 1-249-409-11 | CARBON 220 5% 1/4W | (EX50:E, EA, HK, MY, SP, TH) |

# PANEL PRIMARY SECONDARY

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| R251 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R252 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R253 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R255 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R256 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R257 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R258 | 1-249-422-11 | CARBON 2.7K 5% 1/4W | |
| R259 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R260 | 1-249-411-11 | CARBON 330 5% 1/4W | |
| R262 | 1-249-409-11 | CARBON 220 5% 1/4W | |
| R263 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R264 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R265 | 1-249-423-11 | CARBON 3.3K 5% 1/4W | |
| R266 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R269 | 1-247-903-00 | CARBON 1M 5% 1/4W | |
| R270 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| | | < VARIABLE RESISTOR > | |
| RV201 | 1-223-973-11 | RES, VAR, CARBON 10K/10K (TREBLE) | |
| RV202 | 1-223-973-11 | RES, VAR, CARBON 10K/10K (BASS) | |
| RV204 | 1-223-811-11 | RES, VAR, CARBON 100K/100K (VOLUME) | |
| RV221 | 1-223-974-11 | RES, VAR, CARBON 50K (MIC LEVEL) | (EX50:E, EA, HK, MY, SP, TH) |
| | | < SWITCH > | |
| S101 | 1-554-303-21 | SWITCH, TACTILE (SYSTEM POWER) | |
| S102 | 1-554-303-21 | SWITCH, TACTILE (TUNER) | |
| S103 | 1-554-303-21 | SWITCH, TACTILE (CD) | |
| S104 | 1-554-303-21 | SWITCH, TACTILE (MD) | |
| S105 | 1-554-303-21 | SWITCH, TACTILE (TAPE) | |
| S106 | 1-554-303-21 | SWITCH, TACTILE (VIDEO2/AUX) | |
| S107 | 1-554-303-21 | SWITCH, TACTILE (VIDEO1) | |
| S108 | 1-554-303-21 | SWITCH, TACTILE (-20dB MUTING) | |
| S109 | 1-554-303-21 | SWITCH, TACTILE (SOURCE DIRECT) | |
| S110 | 1-554-303-21 | SWITCH, TACTILE (KARAOKE PON) | (EX50:E, EA, HK, MY, SP, TH) |
| | | < VIBRATOR > | |
| X101 | 1-579-125-11 | VIBRATOR, CERAMIC (8MHz) | |
| ************************************************************** | | | |
| * | 1-659-591-11 | PRIMARY BOARD (EX50:AEP, UK, G, IT, CIS, TH)<br>*************************************** | |
| * | 1-659-592-11 | PRIMARY BOARD (EX50:E, EA, HK, MY, SP/EX90)<br>*************************************** | |
| | 1-533-217-31 | HOLDER, FUSE | |
| | | < CAPACITOR > | |
| ⚠C991 | 1-113-925-51 | ELECT 0.01uF 20% 250V | (EX90) |

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < CONNECTOR > | |
| CN900 | 1-564-321-00 | PIN, CONNECTOR 2P | (EX50:E, EA, HK, MY, SP/EX90) |
| CN911 | 1-564-321-00 | PIN, CONNECTOR 2P | (EX50:AEP, UK, G, IT, CIS, TH) |
| CN991 | 1-580-230-11 | PIN, CONNECTOR (PC BOARD) 2P | (EX90) |
| CN992 | 1-580-230-11 | PIN, CONNECTOR (PC BOARD) 2P | (EX90) |
| CN993 | 1-764-325-11 | PIN, CONNECTOR (PCB)(V TYPE) 2P | (EX90) |
| | | < FUSE > | |
| ⚠F901 | 1-532-078-00 | FUSE, TIME LAG (T1.0AL 250V) | (EX50:E, EA, HK, MY, SP) |
| ⚠F901 | 1-532-285-00 | FUSE, TIME LAG (T1.25AL 250V) | (EX90) |
| ⚠F902 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL 250V) | (EX50:E, EA, HK, MY, SP) |
| ⚠F911 | 1-532-078-00 | FUSE, TIME LAG (T1.0AL 250V) | (EX50:TH) |
| ⚠F911 | 1-532-285-00 | FUSE, TIME LAG (T1.25AL 250V) | (EX50:AEP, UK, G, IT, CIS) |
| ⚠F991 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL 250V) | (EX90) |
| | | < RELAY > | |
| ⚠RY991 | 1-755-018-11 | RELAY | (EX90) |
| | | < SWITCH > | |
| S901 | 1-572-675-11 | SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR) | (EX50:E, EA, HK, MY, SP) |
| ************************************************************** | | | |
| * | 1-659-593-11 | SECONDARY BOARD<br>*************** | |
| | 1-533-217-31 | HOLDER, FUSE | |
| | | < CONNECTOR > | |
| CN901 | 1-770-966-11 | PIN, CONNECTOR (PCB)(V TYPE) 6P | |
| CN902 | 1-764-326-11 | PIN, CONNECTOR (PCB)(V TYPE) 3P | |
| | | < FUSE > | |
| ⚠F903 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL 250V) | |
| ⚠F904 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL 250V) | |
| ************************************************************** | | | |
| | | MISCELLANEOUS<br>************* | |
| 8 | 1-773-187-11 | WIRE (FLAT TYPE)(23 CORE) | |
| ⚠51 | 1-569-007-11 | ADAPTER, CONVERSION 2P | (EX50:E) |
| ⚠51 | 1-569-008-11 | ADAPTER, CONVERSION 2P | (EX50:EA, MY, SP) |
| ⚠51 | 1-770-019-11 | ADAPTOR, CONVERSION PLUG 3P | (EX50:HK) |
| 58 | 1-776-429-11 | CORD (WITH CONNECTOR) | (EX90) |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠CN994 | 1-526-794-11 | OUTLET, AC (AC OUTLET)(EX90) | |
| ⚠CN995 | 1-526-794-11 | OUTLET, AC (AC OUTLET)(EX90) | |
| ⚠CNP901 | 1-575-651-11 | CORD, POWER<br>(EX50:AEP, G, IT, CIS, EA, MY, SP, HK/EX90:AEP, IT) | |
| ⚠CNP901 | 1-575-653-11 | CORD, POWER (EX50:E) | |
| ⚠CNP901 | 1-751-326-31 | CORD, POWER (EX50:TH) | |
| ⚠CNP901 | 1-751-520-21 | CORD, POWER (EX50:UK/EX90:UK) | |
| ⚠F901 | 1-532-078-00 | FUSE, TIME LAG (T1.0AL, 250V)<br>(EX50:E, EA, MY, SP, HK, TH) | |
| ⚠F901 | 1-532-285-00 | FUSE, TIME LAG (T1.25AL, 250V)(EX90) | |
| ⚠F902 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V)<br>(EX50:E, EA, MY, SP, HK) | |
| ⚠F903 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V) | |
| ⚠F904 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V) | |
| ⚠F911 | 1-532-078-00 | FUSE, TIME LAG (T1.0AL, 250V)(EX50:TH) | |
| ⚠F911 | 1-532-285-00 | FUSE, TIME LAG (T1.25AL, 250V)<br>(EX50:AEP, UK, G, IT, CIS) | |
| ⚠F991 | 1-532-286-00 | FUSE, TIME LAG (T2.5AL, 250V)(EX90) | |
| ⚠M1001 | 1-698-720-11 | MOTOR, FAN (DC)(EX90) | |
| RV204 | 1-223-811-11 | RES, VAR, CARBON 100K/100K (VOLUME) | |
| ⚠T901 | 1-429-311-11 | TRANSFORMER, POWER<br>(EX50:E, EA, MY, SP, HK, TH) | |
| ⚠T901 | 1-429-312-11 | TRANSFORMER, POWER(EX90) | |
| ⚠T901 | 1-429-484-11 | TRANSFORMER, POWER(EX50:AEP, UK, G, IT, CIS) | |

***************************************************************

## ACCESSORIES & PACKING MATERIALS
*******************************

| | | |
|---|---|---|
| * | 4-980-537-01 | CUSHION (UPPER) |
| * | 4-980-538-01 | CUSHION (LOWER) |

***************************************************************

*******************
## HARDWARE LIST
*******************

| | | |
|---|---|---|
| #1 | 7-685-647-79 | SCREW +BVTP 3X10 TYPE2 N-S |
| #2 | 7-682-548-04 | SCREW +BVTT 3X8 (S) |
| #3 | 7-685-650-79 | SCREW +BVTP 3X16 TYPE2 IT-3 |
| #4 | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

English
96B0978-1
Printed in Japan
© 1996. 2
Published by Home A&V Products Div.
Quality Engineering Dept.

**Sony Corporation**
**Consumer A&V Products Company**
**Home A&V Products Div.**

# SA-EX100/S900

# SERVICE MANUAL

US Model
Canadian Model
Tourist Model
*SA-S900*
AEP Model
UK Model
Australian Model
*SA-EX100*
E Model
*SA-EX100/S900*

**Photo : SA-S900 model (US model)**

SA-EX100 is the ACTIVE SPEAKER SYSTEM section in MHC-EX10AV.
SA-S900 is the ACTIVE SPEAKER SYSTEM section in MHC-C9EX.

## SPECIFICATIONS

(Woofer)
With 6 ohm loads driven, from 40 – 3,000 Hz; rated 50 watts minimum RMS power, with no more than 0.9% total harmonic distortion from 250 milliwatts to rated output.

(Tweeter)
With 50 ohm loads driven, from 3,000 – 20,000 Hz; rated 8 watts minimum RMS power, with no more than 0.9% total harmonic distoration from 250 milliwatts to rated output.

| | |
|---|---|
| Speaker system | Active speaker, 2-way, bass-reflex type |
| Speaker units | |
| Woofer: | 15 cm dia., cone type |
| Tweeter: | 2.5 x 10 cm, electrostatic type |
| Continuous RMS power output | |
| Woofer: | 50 W + 50 W<br>(6 ohms at 40 – 3,000 Hz, 0.9% THD)<br>65 W + 65 W<br>(6 ohms at 1 KHz, 5% THD) |
| Tweeter: | 8 W + 8 W<br>(50 ohms at 3,000 – 20,000 Hz, 0.9% THD)<br>10 W + 10 W<br>(50 ohms at 10 kHz, 5% THD) |
| Power consumpiton | 60 W |
| Dimensions | Approx. 220 x 455 x 350 mm (w/h/d)<br>(8 3/4 x 18 x 13 7/8 inches) |
| Mass | Approx. 8.2 kg<br>(18 lb 1 oz) net per speaker |

Power requirements

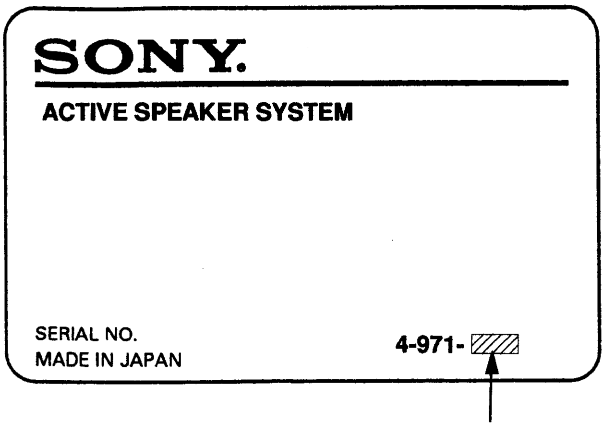
120 V AC, 60 Hz (US, Canadian model)
220 – 230 V AC 50/60 Hz (AEP, UK model)
110 – 120, 220 – 240 V AC adjustble 50/60 Hz
(E, Australian, Tourist model)

## ACTIVE SPEAKER SYSTEM

SONY®

## MODEL IDENTIFICATION

*— Specification Label —*



| | | |
|---|---|---|
| SA-S900 | US, Canadian model | : 390-□□ |
| | E, Tourist model | : 391-□□ |
| SA-EX100 | AEP model | : 393-□□ |
| | UK, German model | : 394-□□ |
| | E, Australian model | : 392-□□ |

## TABLE OF CONTENTS

Section Title Page

SECTION 1. DISASSEMBLY

1-1. Back Cover/Rear Cabinet .................................................. 3
1-2. Front Panel ........................................................................ 3

SECTION 2. DIAGRAMS

2-1. Circuit Boards Location ..................................................... 4
2-2. Semiconductor Lead Layouts .......................................... 4
2-3. Schematic Diagram ........................................................... 5
2-4. Printed Wiring Board ........................................................ 7

SECTION 3. EXPLODED VIEWS

3-1. Cabinet Section ................................................................ 10
3-2. Amp Section ...................................................................... 11

SECTION 4. ELECTRICAL PARTS LIST ........................ 12

## SAFETY CHECK-OUT

(US model only)

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.

2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

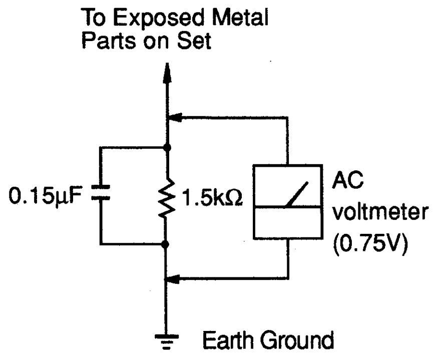


Fig. A. Using an AC voltmeter to check AC leakage.

**SAFETY-RELATED COMPONENT WARNING !!**

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

**ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!**

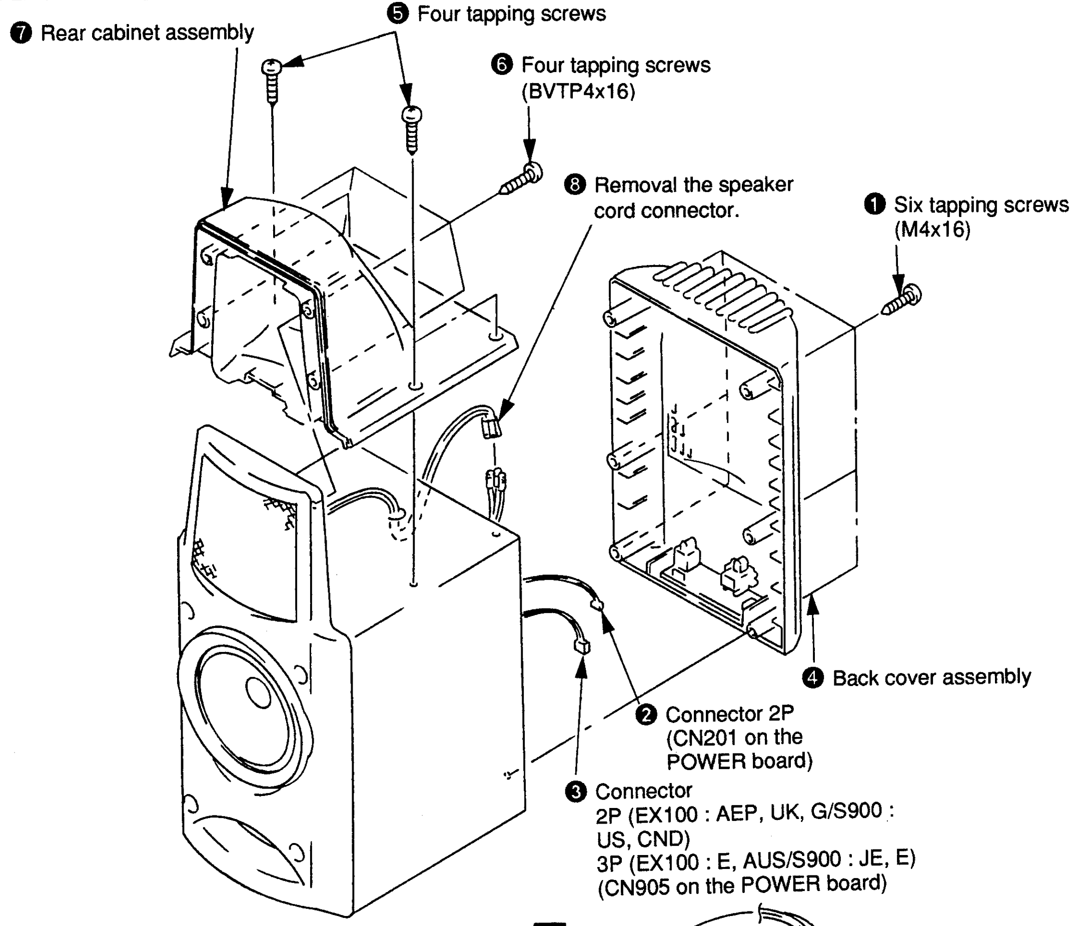
**LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.**

# SECTION 1

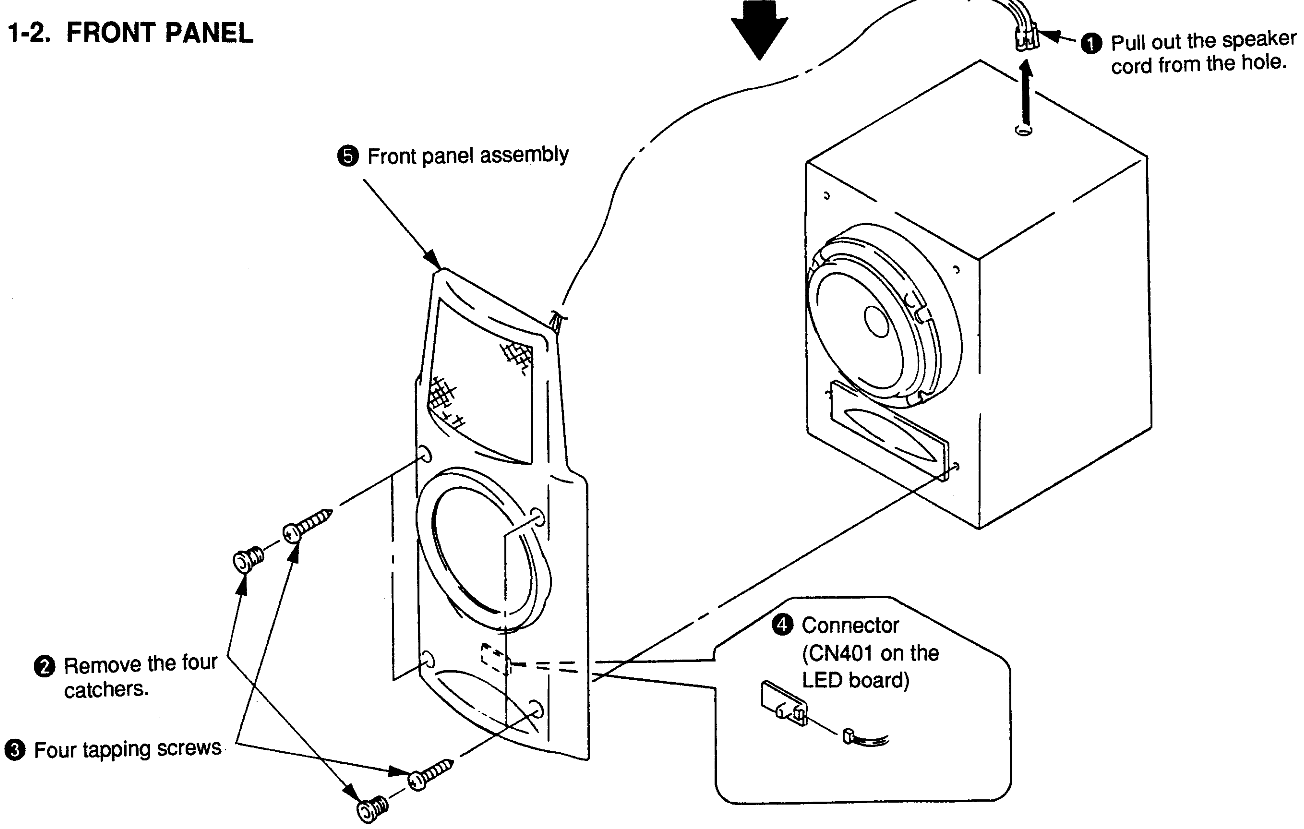
# DISASSEMBLY

**Note :** Follow the disassembly procedure in the number order given.

## 1-1. BACK COVER/REAR CABINET

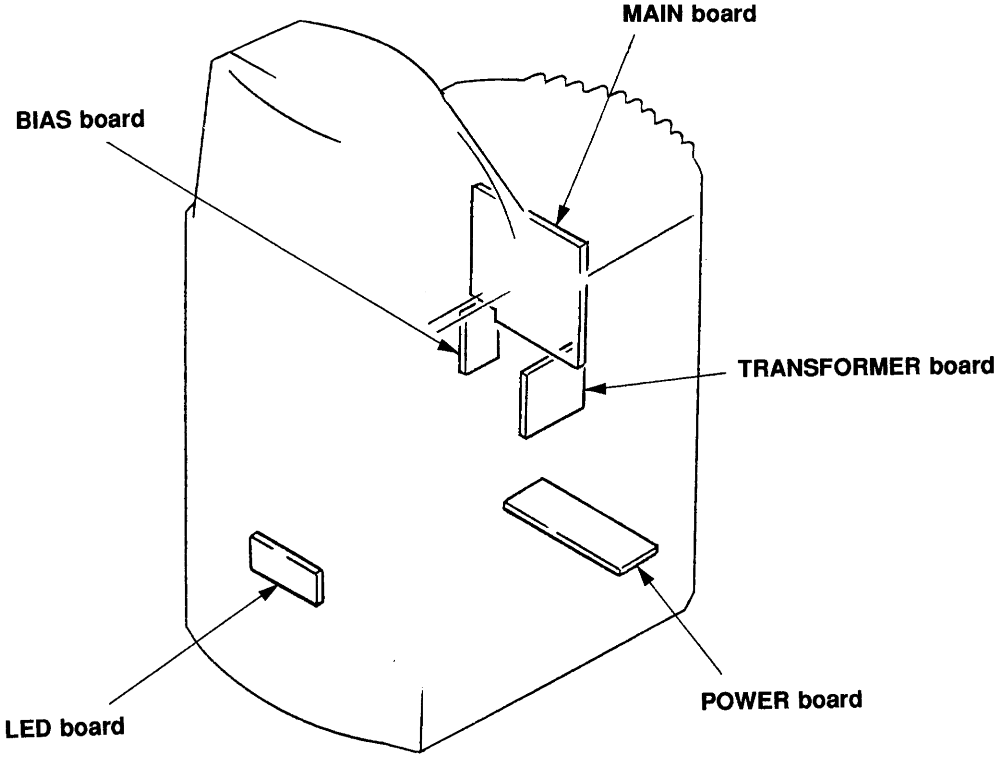

❼ Rear cabinet assembly
❺ Four tapping screws
❻ Four tapping screws (BVTP4x16)
❽ Removal the speaker cord connector.
❶ Six tapping screws (M4x16)
❹ Back cover assembly
❷ Connector 2P (CN201 on the POWER board)
❸ Connector
2P (EX100 : AEP, UK, G/S900 : US, CND)
3P (EX100 : E, AUS/S900 : JE, E)
(CN905 on the POWER board)

## 1-2. FRONT PANEL


❶ Pull out the speaker cord from the hole.
❺ Front panel assembly
❷ Remove the four catchers.
❸ Four tapping screws
❹ Connector (CN401 on the LED board)

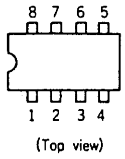
# SECTION 2
# DIAGRAMS

## 2-1. CIRCUIT BOARDS LOCATION

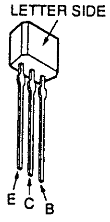

MAIN board
BIAS board
TRANSFORMER board
POWER board
LED board

## 2-2. SEMICONDUCTOR LEAD LAYOUTS

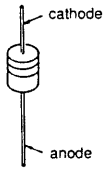
**RC5532DD**


8 7 6 5
1 2 3 4
(Top view)

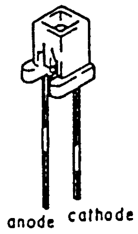
**2SA1175-HFE**


LETTER SIDE
E C B

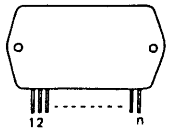
**HZS16-2L**


cathode
anode

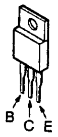
**SEL3510C-CD**


anode
cathode

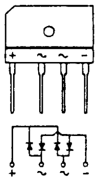
**STK401-100B**



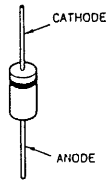
**2SB1094-LK**
**2SD2012**



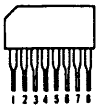
**RBA-402**



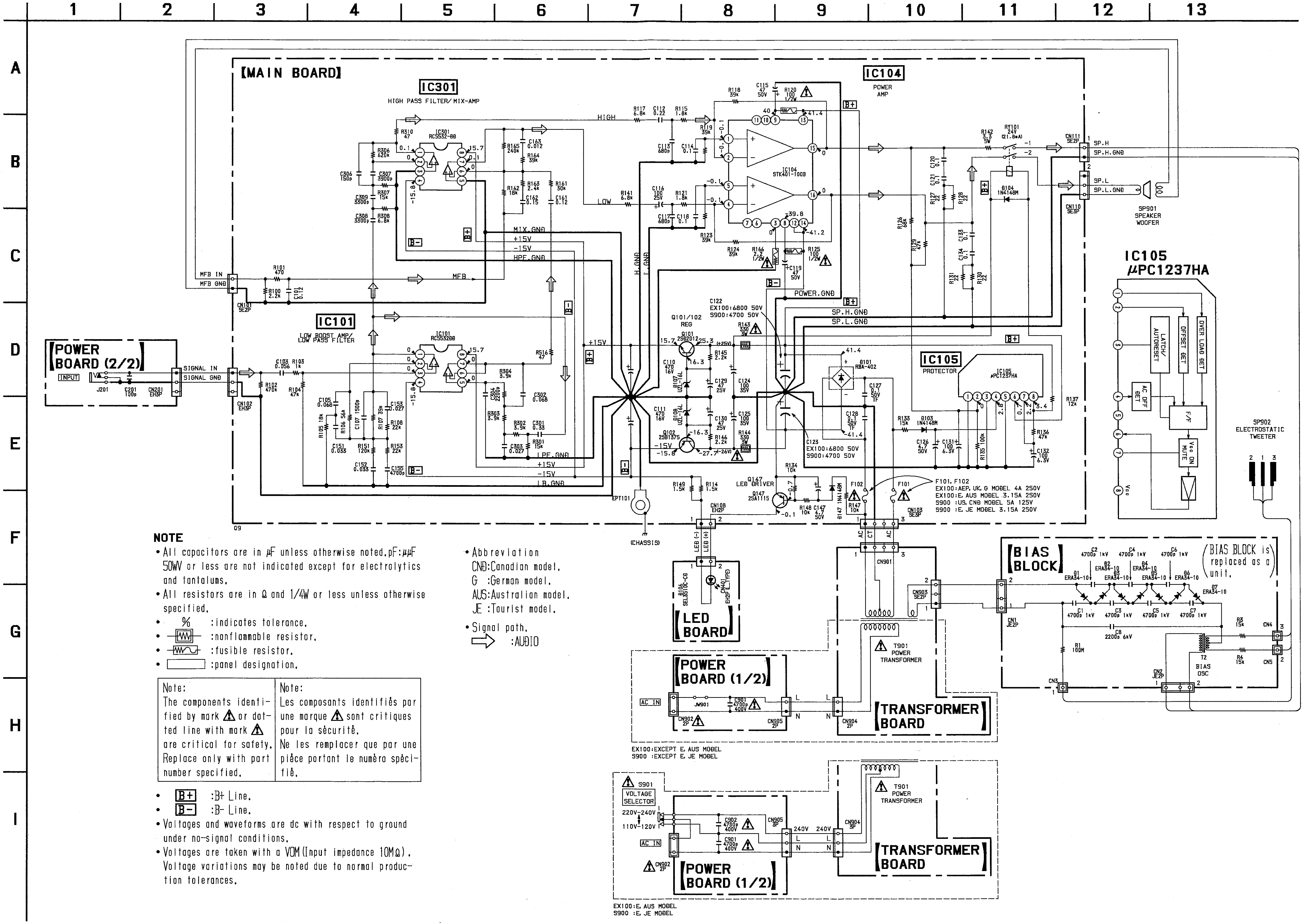
**1N4148M**


CATHODE
ANODE

**µPC1237HA**



## 2-3. SCHEMATIC DIAGRAM


1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I
[MAIN BOARD]
IC301
HIGH PASS FILTER/MIX-AMP
IC301 RC5532-DD
IC104
POWER AMP
IC104 STK401-100B
IC101
LOW BOOST AMP/ LOW PASS FILTER
IC101 RC5532DD
IC105
PROTECTOR
IC105 μPC1237HA
HIGH
LOW
MFB
MFB IN
MFB GND
CN101 SE2P
MIX.GND
+15V
-15V
HPF.GND
LPF.GND
LB.GND
POWER.GND
SP.H.GND
SP.L.GND
SIGNAL IN
SIGNAL GND
CN102 EH3P
[POWER BOARD (2/2)]
INPUT
J201
C201 100p
CN201 EH3P
Q101/102 REG
Q101 2SD2012
Q102 2SB1375
Q147 LED DRIVER
Q147 2SA1115
D101 RBA-402
D104 1N4148M
D103 1N4148M
RY101 24V (21.8mA)
C122 EX100:6800 50V S900:4700 50V
C123 EX100:6800 50V S900:4700 50V
EPT101
(CHASSIS)
CN108 EH2P
CN103 SE3P
F101, F102
EX100:AEP, UK, G MODEL 4A 250V
EX100:E, AUS MODEL 3.15A 250V
S900 :US, CND MODEL 5A 125V
S900 :E, JE MODEL 3.15A 250V
F101
F102
AC CT AC
CN111 SE2P
SP.H
SP.H.GND
SP.L
SP.L.GND
CN110 SE3P
SP901 SPEAKER WOOFER
IC105 μPC1237HA
LATCH/ AUTORESET
OFFSET DET
OVER LOAD DET
AC OFF DET
F/F
Vcc ON MUTE
Vcc
SP902 ELECTROSTATIC TWEETER
2 1 3
[LED BOARD]
D106 SEL6010-C8
LED (-)
LED (+)
CN901
CN903 SE2P
[BIAS BLOCK]
(BIAS BLOCK is replaced as a unit.)
C1 4700p 1kV
C2 4700p 1kV
C3 4700p 1kV
C4 4700p 1kV
C5 4700p 1kV
C6 4700p 1kV
C7 4700p 1kV
C8 2200p 6kV
D1 ERA34-10
D2 ERA34-10
D3 ERA34-10
D4 ERA34-10
D5 ERA34-10
D6 ERA34-10
D7 ERA34-10
R1 100M
R3 15k
R4 15k
T2 BIAS OSC
CN1 JE2P
CN2 JE2P
CN3
CN4
CN5
T901 POWER TRANSFORMER
[POWER BOARD (1/2)]
AC IN
JW901
C901 4700p 400V
CN902 2P
CN905 2P
CN904 2P
L
N
[TRANSFORMER BOARD]
EX100:EXCEPT E, AUS MODEL
S900 :EXCEPT E, JE MODEL
S901
VOLTAGE SELECTOR
220V-240V
110V-120V
C902 4700p 400V
C901 4700p 400V
CN905 3P
CN904 3P
240V 240V
EX100:E, AUS MODEL
S900 :E, JE MODEL

**NOTE**

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % :indicates tolerance.
- ▭ :nonflammable resistor.
- ▭ :fusible resistor.
- ▭ :panel designation.

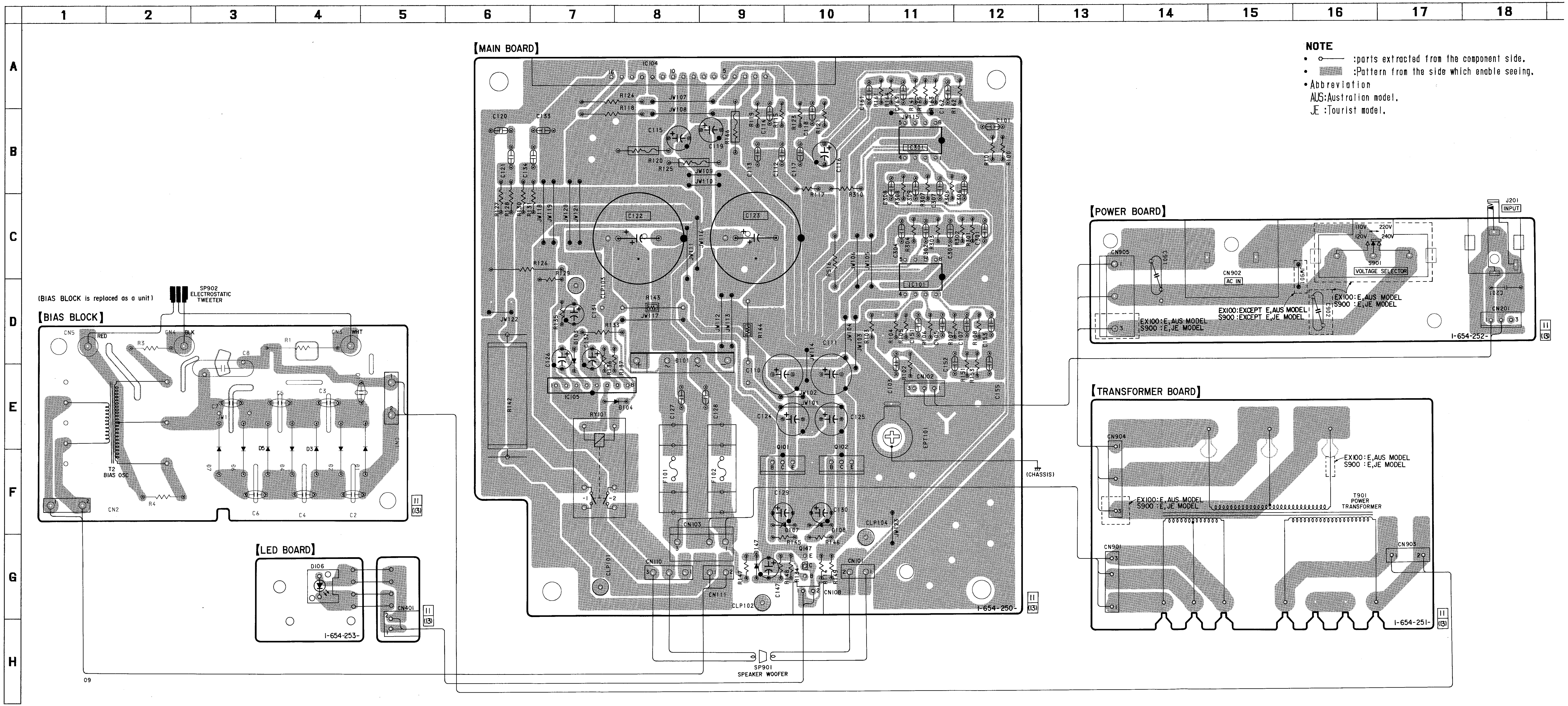
| Note: | Note: |
|---|---|
| The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified. | Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié. |

- B+ :B+ Line.
- B- :B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

- Abbreviation
  CND:Canadian model.
  G :German model.
  AUS:Australian model.
  JE :Tourist model.
- Signal path.
  ⇨ :AUDIO

## 2-4. PRINTED WIRING BOARD

- See page 4 for Circuit Boards Location.
- See page 4 for Semiconductor Lead Layouts.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
A
B
C
D
E
F
G
H
【MAIN BOARD】
IC104
IC105
IC101
IC301
C122
C123
Q101
Q102
Q147
D101
D103
D104
D106
D107
D108
RY101
EPT101
F101
F102
CN101
CN102
CN103
CN108
CN110
CN111
CLP101
CLP102
CLP104
(CHASSIS)
1-654-250-
11
(13)
(BIAS BLOCK is replaced as a unit)
SP902
ELECTROSTATIC
TWEETER
【BIAS BLOCK】
CN5
RED
CN4
BLK
CN3
WHT
CN2
CN1
T2
BIAS OSC
【LED BOARD】
D106
CN401
1-654-253-
SP901
SPEAKER WOOFER
【POWER BOARD】
J201
INPUT
CN905
CN902
AC IN
S901
VOLTAGE SELECTOR
110V
120V
220V
240V
CN201
EX100:E,AUS MODEL
S900 :E,JE MODEL
EX100:EXCEPT E,AUS MODEL
S900:EXCEPT E,JE MODEL
1-654-252-
【TRANSFORMER BOARD】
CN904
CN901
CN903
T901
POWER
TRANSFORMER
EX100:E,AUS MODEL
S900 :E,JE MODEL
1-654-251-

**NOTE**

- ○—— :parts extracted from the component side.
- ▨ :Pattern from the side which enable seeing.
- Abbreviation
  AUS:Australian model.
  JE :Tourist model.

- **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| D101 | E-8 |
| D103 | D-7 |
| D104 | E-8 |
| D106 | G-4 |
| D107 | G-9 |
| D108 | F-10 |
| D147 | G-9 |
| IC101 | D-11 |
| IC104 | A-7 |
| IC105 | E-7 |
| IC301 | B-11 |
| Q101 | F-9 |
| Q102 | F-10 |
| Q147 | G-10 |

# SECTION 3
# EXPLODED VIEWS

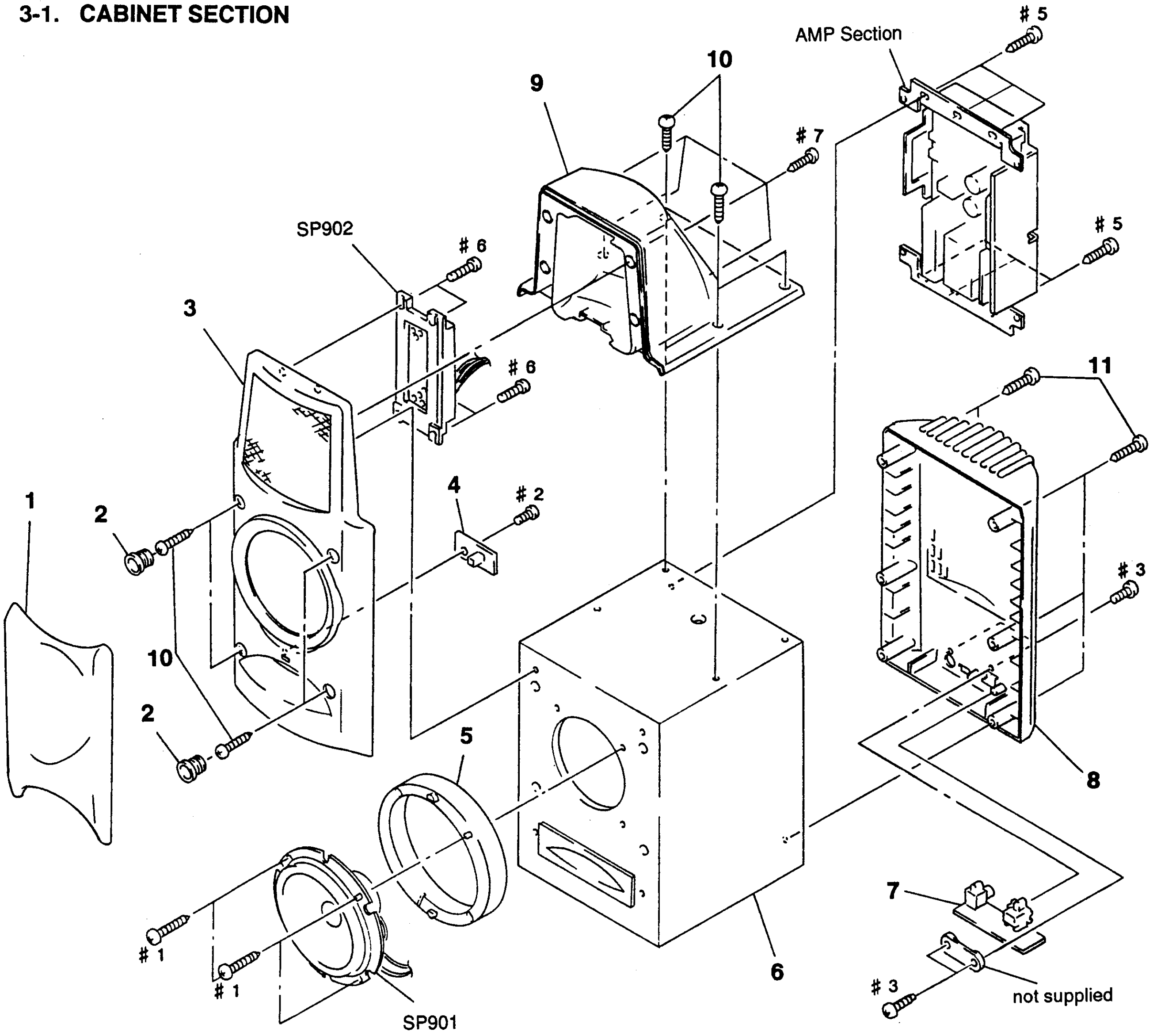
NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  - CND : Canadian model
  - G : German model
  - AUS : Australian model
  - JE : Tourist model
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

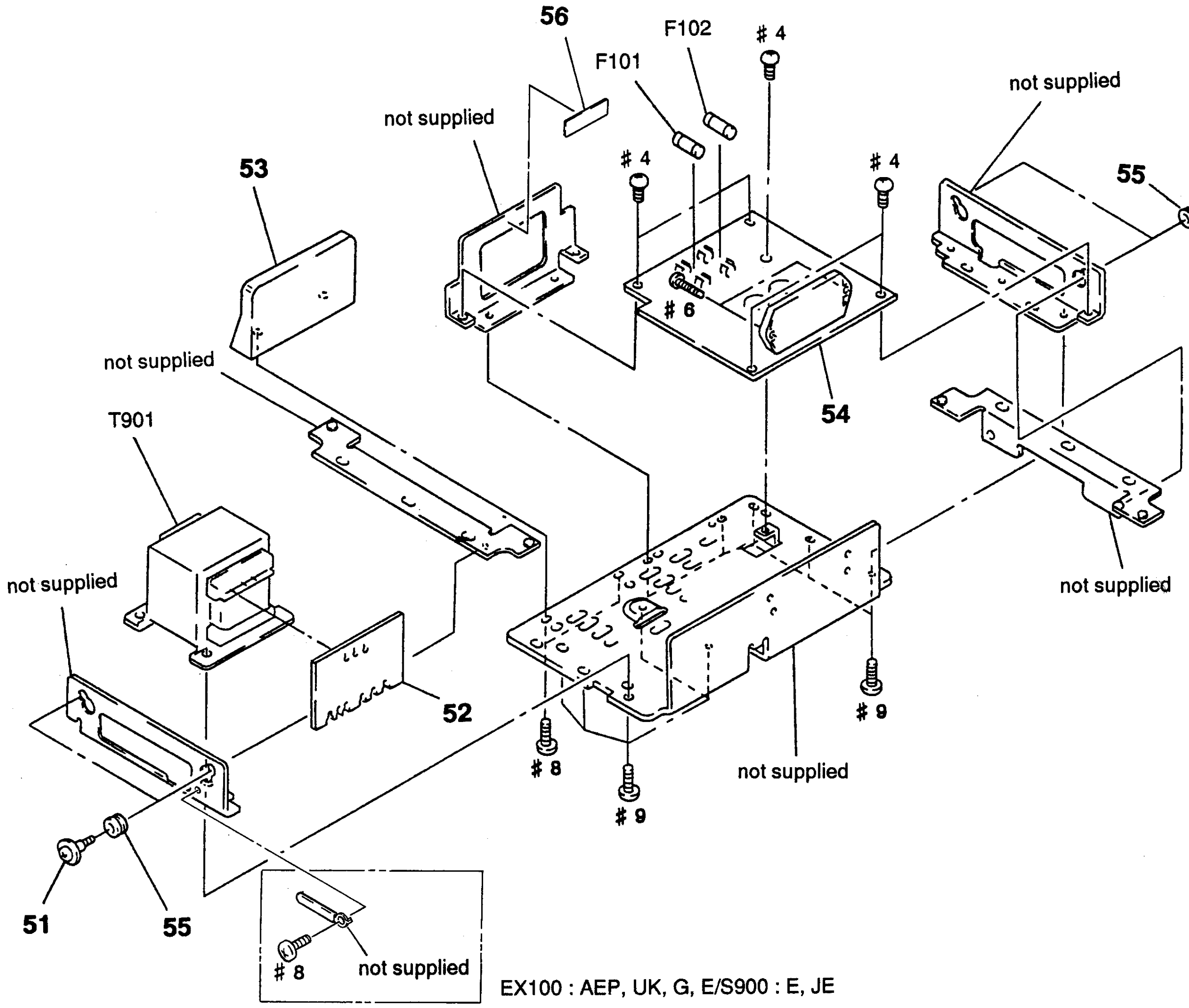
## 3-1. CABINET SECTION



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | X-4945-291-1 | FRAME ASSY, GRILLE | |
| 2 | 4-912-253-01 | CATCHER | |
| 3 | X-4945-290-1 | PANEL ASSY, FRONT (EX100/S900:JE, E) | |
| 3 | X-4945-541-1 | PANEL ASSY, FRONT (S900:US, CND) | |
| * 4 | 1-654-253-11 | LED BOARD | |
| * 5 | X-4945-293-1 | RING ASSY, WOOFER | |
| * 6 | A-4361-186-A | CABINET ASSY, SPEAKER (EXCEPT EX100:G) | |
| * 6 | A-4361-310-A | CABINET ASSY, SPEAKER (EX100:G) | |
| * 7 | 1-654-252-11 | POWER BOARD | |
| 8 | X-4945-731-1 | COVER ASSY, BACK (EX100:AEP, UK, G) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 8 | X-4945-860-1 | COVER ASSY, BACK (S900:US, CND) | |
| 8 | X-4945-861-1 | COVER ASSY, BACK (EX100:E, AUS/S900:JE, E) | |
| * 9 | X-4945-292-1 | CABINET ASSY, REAR (EX100/S900:JE, E) | |
| * 9 | X-4945-542-1 | CABINET ASSY, REAR (S900:US, CND) | |
| 10 | 4-962-063-01 | SCREW | |
| 11 | 4-923-040-11 | SCREW (4X16), TAPPING | |
| SP901 | 1-504-671-11 | SPEAKER (WOOFER) (15cm) | |
| SP902 | 1-504-680-11 | SPEAKER (TWEETER) (2. 2X10) (EX100/S900:JE, E) | |
| SP902 | 1-504-680-21 | SPEAKER (TWEETER) (2. 2X10) (S900:US, CND) | |

## 3-2. AMP SECTION


56
F102
#4
F101
not supplied
51
not supplied
#4
#4
55
53
#6
not supplied
54
T901
not supplied
not supplied
52
#9
#8
not supplied
#9
51
55
#8
not supplied

EX100 : AEP, UK, G, E/S900 : E, JE

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 51 | 4-959-869-01 | SCREW (STEP) (M3X6) | |
| * 52 | 1-654-251-11 | TRANSFORMER BOARD | |
| 53 | A-4361-196-A | BIAS BLOCK ASSY (EX100/S900:JE, E) | |
| 53 | A-4361-296-A | BIAS BLOCK ASSY (S900:US, CND) | |
| * 54 | A-4377-583-A | MAIN BOARD, COMPLETE (EX100) | |
| * 54 | A-4377-584-A | MAIN BOARD, COMPLETE (S900) | |
| * 55 | 4-941-563-01 | BUSHING | |
| 56 | 3-703-044-26 | LABEL, CAUTION (S900:US, CND) | |
| ⚠F101 | 1-532-237-00 | FUSE, TIME LAG (3.15A 250V) (EX100:E, AUS/S900:JE, E) | |
| ⚠F101 | 1-532-350-00 | FUSE (4A 250V) (EX100:AEP, UK, G) | |
| ⚠F101 | 1-533-420-11 | FUSE, GLASS CYLINDRICAL (DIA. 5) (5A 125V) (S900:US, CND) | |
| ⚠F102 | 1-532-237-00 | FUSE, TIME LAG (3.15A 250V) (EX100:E, AUS/S900:JE, E) | |
| ⚠F102 | 1-532-350-00 | FUSE (4A 250V) (EX100:AEP, UK, G) | |
| ⚠F102 | 1-533-420-11 | FUSE, GLASS CYLINDRICAL (DIA. 5) (5A 125V) (S900:US, CND) | |
| ⚠T901 | 1-427-744-11 | TRANSFORMER, POWER (S900:US, CND) | |
| ⚠T901 | 1-427-745-11 | TRANSFORMER, POWER (EX100:AEP, UK, G) | |
| ⚠T901 | 1-427-746-11 | TRANSFORMER, POWER (EX100:E, AUS/S900:JE, E) | |

# SECTION 4
# ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  - CND : Canadian model
  - G : German model
  - AUS : Australian model
  - JE : Tourist model
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 1-654-253-11 | LED BOARD | |
| | | ********* | |
| | | < CONNECTOR > | |
| CN401 | 1-564-517-11 | PLUG, CONNECTOR 2P | |
| | | < DIODE > | |
| D106 | 8-719-018-46 | DIODE SEL3510C-CD | |
| ************************************************************ | | | |
| * | A-4377-583-A | MAIN BOARD, COMPLETE (EX100) | |
| | | *************************** | |
| * | A-4377-584-A | MAIN BOARD, COMPLETE (S900) | |
| | | ************************** | |
| | 1-533-293-11 | FUSE HOLDER | |
| | | < CAPACITOR > | |
| C101 | 1-136-166-00 | FILM 0.12uF 5% 50V | |
| C103 | 1-136-162-00 | FILM 0.056uF 5% 50V | |
| C105 | 1-136-163-00 | FILM 0.068uF 5% 50V | |
| C107 | 1-130-473-00 | MYLAR 0.0015uF 5% 50V | |
| C110 | 1-126-012-11 | ELECT 470uF 20% 16V | |
| C111 | 1-126-012-11 | ELECT 470uF 20% 16V | |
| C112 | 1-136-169-00 | FILM 0.22uF 5% 50V | |
| C113 | 1-130-469-00 | MYLAR 680PF 5% 50V | |
| C114 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C115 | 1-124-910-11 | ELECT 47uF 20% 50V | |
| C116 | 1-124-122-11 | ELECT 100uF 20% 50V | (EX100) |
| C116 | 1-124-478-11 | ELECT 100uF 20% 25V | (S900) |
| C117 | 1-130-469-00 | MYLAR 680PF 5% 50V | |
| C118 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C119 | 1-124-910-11 | ELECT 47uF 20% 50V | |
| C120 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C121 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C122 | 1-110-667-11 | ELECT 6800uF 50V | (EX100) |
| C122 | 1-126-138-11 | ELECT 4700uF 20% 50V | (S900) |
| C123 | 1-110-667-11 | ELECT 6800uF 50V | (EX100) |
| C123 | 1-126-138-11 | ELECT 4700uF 20% 50V | (S900) |
| C124 | 1-124-122-11 | ELECT 100uF 20% 50V | |
| C125 | 1-124-122-11 | ELECT 100uF 20% 50V | |
| C126 | 1-124-927-11 | ELECT 4.7uF 20% 100V | |
| C127 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C128 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C129 | 1-124-910-11 | ELECT 47uF 20% 50V | |
| C130 | 1-124-910-11 | ELECT 47uF 20% 50V | |
| C131 | 1-124-443-00 | ELECT 100uF 20% 10V | |
| C132 | 1-124-443-00 | ELECT 100uF 20% 10V | |
| C133 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C134 | 1-136-165-00 | FILM 0.1uF 5% 50V | |
| C147 | 1-124-927-11 | ELECT 4.7uF 20% 100V | |
| C151 | 1-136-159-00 | FILM 0.033uF 5% 50V | |
| C152 | 1-136-159-00 | FILM 0.033uF 5% 50V | |
| C153 | 1-130-488-00 | MYLAR 0.027uF 5% 50V | |
| C155 | 1-130-479-00 | MYLAR 0.0047uF 5% 50V | |
| C161 | 1-136-166-00 | FILM 0.12uF 5% 50V | |
| C162 | 1-136-167-00 | FILM 0.15uF 5% 50V | |
| C163 | 1-130-484-00 | MYLAR 0.012uF 5% 50V | |
| C301 | 1-136-171-00 | FILM 0.33uF 5% 50V | |
| C302 | 1-136-163-00 | FILM 0.068uF 5% 50V | |
| C303 | 1-130-488-00 | MYLAR 0.027uF 5% 50V | |
| C304 | 1-130-475-00 | MYLAR 0.0022uF 5% 50V | |
| C306 | 1-110-337-51 | MYLAR 150PF 5% 50V | |
| C307 | 1-130-478-00 | MYLAR 0.0039uF 5% 50V | |
| C308 | 1-130-477-00 | MYLAR 0.0033uF 5% 50V | |
| C309 | 1-130-477-00 | MYLAR 0.0033uF 5% 50V | |
| | | < CONNECTOR > | |
| CN101 | 1-566-693-11 | PIN, CONNECTOR 2P | |
| CN102 | 1-564-506-11 | PLUG, CONNECTOR 3P | |
| CN103 | 1-565-395-11 | PIN, CONNECTOR 3P | |
| CN108 | 1-564-517-11 | PLUG, CONNECTOR 2P | |
| CN110 | 1-564-214-11 | PIN, CONNECTOR 3P | |
| CN111 | 1-566-693-11 | PIN, CONNECTOR 2P | |
| | | < DIODE > | |
| D101 | 8-719-312-09 | DIODE RBA-402 | |
| D103 | 8-719-987-63 | DIODE 1N4148M | |
| D104 | 8-719-987-63 | DIODE 1N4148M | |
| D107 | 8-719-933-88 | DIODE HZS16-2L | |
| D108 | 8-719-933-88 | DIODE HZS16-2L | |
| D147 | 8-719-987-63 | DIODE 1N4148M | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| | | < GROUND PLATE > | |
| * EPT101 | 4-870-539-00 | PLATE, GROUND | |
| | | < FUSE > | |
| ⚠F101 | 1-532-237-00 | FUSE, TIME LAG (3.15A 250V)<br>(EX100:E, AUS/S900:E, JE) | |
| ⚠F101 | 1-532-350-00 | FUSE, (4A 250V) (EX100:AEP, UK, G) | |
| ⚠F101 | 1-533-420-11 | FUSE, GLASS CYLINDRICAL (DIA. 5)<br>(5A 125V) (S900:US, CND) | |
| ⚠F102 | 1-532-237-00 | FUSE, TIME LAG (3.15A 250V)<br>(EX100:E, AUS/S900:E, JE) | |
| ⚠F102 | 1-532-350-00 | FUSE, (4A 250V) (EX100:AEP, UK, G) | |
| ⚠F102 | 1-533-420-11 | FUSE, GLASS CYLINDRICAL (DIA. 5)<br>(5A 125V) (S900:US, CND) | |
| | | < IC > | |
| IC101 | 8-759-982-03 | IC RC5532DD | |
| IC104 | 8-749-924-68 | IC STK401-100B | |
| IC105 | 8-759-111-68 | IC uPC1237HA | |
| IC301 | 8-759-982-03 | IC RC5532DD | |
| | | < TRANSISTOR > | |
| Q101 | 8-729-209-15 | TRANSISTOR 2SD2012 | |
| Q102 | 8-729-141-83 | TRANSISTOR 2SB1094-LK | |
| Q147 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| | | < RESISTOR > | |
| R100 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | F |
| R101 | 1-249-413-11 | CARBON 470 5% 1/4W | F |
| R102 | 1-247-895-00 | CARBON 470K 5% 1/4W | |
| R103 | 1-249-417-11 | CARBON 1K 5% 1/4W | F |
| R104 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R105 | 1-249-432-11 | CARBON 18K 5% 1/4W | |
| R106 | 1-249-438-11 | CARBON 56K 5% 1/4W | |
| R107 | 1-249-436-11 | CARBON 39K 5% 1/4W | |
| R108 | 1-249-433-11 | CARBON 22K 5% 1/4W | |
| R114 | 1-249-419-11 | CARBON 1.5K 5% 1/4W | F |
| R115 | 1-249-420-11 | CARBON 1.8K 5% 1/4W | F |
| R117 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | F |
| R118 | 1-249-436-11 | CARBON 39K 5% 1/4W | |
| R119 | 1-249-436-11 | CARBON 39K 5% 1/4W | |
| ⚠R120 | 1-212-982-00 | FUSIBLE 100 5% 1/2W | F |
| R121 | 1-249-420-11 | CARBON 1.8K 5% 1/4W | F |
| R123 | 1-249-436-11 | CARBON 39K 5% 1/4W | |
| R124 | 1-249-436-11 | CARBON 39K 5% 1/4W | |
| ⚠R125 | 1-212-982-00 | FUSIBLE 100 5% 1/2W | F |
| R126 | 1-249-439-11 | CARBON 68K 5% 1/4W | |
| R127 | 1-249-397-11 | CARBON 22 5% 1/4W | F |
| R128 | 1-249-397-11 | CARBON 22 5% 1/4W | F |
| R129 | 1-249-437-11 | CARBON 47K 5% 1/4W | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R130 | 1-249-397-11 | CARBON 22 5% 1/4W | F |
| R131 | 1-249-397-11 | CARBON 22 5% 1/4W | F |
| R133 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R134 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R135 | 1-249-441-11 | CARBON 100K 5% 1/4W | |
| R136 | 1-249-437-11 | CARBON 47K 5% 1/4W | |
| R137 | 1-249-430-11 | CARBON 12K 5% 1/4W | |
| R141 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | F |
| R142 | 1-208-960-11 | METAL PLATE 3.3 5W | |
| ⚠R143 | 1-215-914-11 | METAL OXIDE 330 5% 3W | F |
| ⚠R144 | 1-215-914-11 | METAL OXIDE 330 5% 3W | F |
| R145 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | F |
| R146 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | F |
| R147 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R148 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R149 | 1-249-419-11 | CARBON 1.5K 5% 1/4W | F |
| R151 | 1-247-881-00 | CARBON 120K 5% 1/4W | |
| R153 | 1-247-862-11 | CARBON 20K 5% 1/4W | |
| R161 | 1-247-866-11 | CARBON 30K 5% 1/4W | |
| R162 | 1-249-432-11 | CARBON 18K 5% 1/4W | |
| R163 | 1-247-840-00 | CARBON 2.4K 5% 1/4W | |
| R164 | 1-249-436-11 | CARBON 39K 5% 1/4W | |
| R165 | 1-247-888-11 | CARBON 240K 5% 1/4W | |
| ⚠R166 | 1-212-942-00 | FUSIBLE 2.2 5% 1/2W | F |
| R301 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R302 | 1-249-424-11 | CARBON 3.9K 5% 1/4W | F |
| R303 | 1-249-424-11 | CARBON 3.9K 5% 1/4W | F |
| R304 | 1-249-424-11 | CARBON 3.9K 5% 1/4W | F |
| R306 | 1-247-898-11 | CARBON 620K 5% 1/4W | |
| R307 | 1-249-431-11 | CARBON 15K 5% 1/4W | |
| R308 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | F |
| R310 | 1-249-401-11 | CARBON 47 5% 1/4W | F |
| R516 | 1-249-401-11 | CARBON 47 5% 1/4W | F |
| | | < RELAY > | |
| RY101 | 1-515-920-11 | RELAY (24V) | |

**************************************************************

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 1-654-252-11 | POWER BOARD<br>*********** | |
| | | < CAPACITOR > | |
| C201 | 1-162-282-31 | CERAMIC 100PF 10% 50V | |
| ⚠C901 | 1-161-743-00 | CERAMIC 0.0047uF 400V | |
| ⚠C902 | 1-161-743-00 | CERAMIC 0.0047uF 400V<br>(EX100:E, AUS/S900:E, JE) | |
| | | < CONNECTOR > | |
| CN201 | 1-564-506-11 | PLUG, CONNECTOR 3P | |

| | |
|---|---|
| The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.<br>Replace only with part number specified. | Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.<br>Ne les remplacer que par une piéce portant le numéro spécifié. |

## POWER TRANSFORMER

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠CN902 | 1-526-930-11 | INLET, AC (AC IN)(S900) | |
| ⚠CN902 | 1-526-931-11 | INLET, AC (AC IN)(EX100) | |
| CN905 | 1-564-321-00 | PIN, CONNECTOR 2P (EX100:AEP, UK, G/S900:US, CND) | |
| CN905 | 1-564-687-11 | PIN, CONNECTOR 3P (EX100:E, AUS/S900:E, JE) | |

< JACK >

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| J201 | 1-750-969-11 | JACK, PIN (INPUT) | |

< SWITCH >

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠S901 | 1-572-675-11 | SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR)(EX100:E, AUS/S900:E, JE) | |

*************************************************************

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 1-654-251-11 | TRANSFORMER BOARD | |

*****************

< CONNECTOR >

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CN903 | 1-568-226-11 | PIN, CONNECTOR 2P | |
| CN904 | 1-769-292-31 | LEAD (WITH CONNECTOR)(3 CORE) (EX100:E, AUS/S900:E, JE) | |
| CN904 | 1-690-123-31 | REED (WITH CONNECTOR)(2 CORE) (EX100:AEP, UK, G/S900:US, CND) | |

< TRANSFORMER >

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠T901 | 1-427-744-11 | TRANSFORMER, POWER (S900:US, CND) | |
| ⚠T901 | 1-427-745-11 | TRANSFORMER, POWER (EX100:AEP, UK, G) | |
| ⚠T901 | 1-427-746-11 | TRANSFORMER, POWER (EX100:E, AUS/S900:E, JE) | |

*************************************************************

MISCELLANEOUS

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| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠F101 | 1-532-237-00 | FUSE, TIME LAG (3.15A 250V) (EX100:E, AUS/S900:E, JE) | |
| ⚠F101 | 1-532-350-00 | FUSE (4A 250V)(EX100:AEP, UK, G) | |
| ⚠F101 | 1-533-420-11 | FUSE, GLASS CYLINDRICAL (DIA.5) (5A 125V)(S900:US, CND) | |
| ⚠F102 | 1-532-237-00 | FUSE, TIME LAG (3.15A 250V) (EX100:E, AUS/S900:E, JE) | |
| ⚠F102 | 1-532-350-00 | FUSE (4A 250V)(EX100:AEP, UK, G) | |
| ⚠F102 | 1-533-420-11 | FUSE, GLASS CYLINDRICAL (DIA.5) (5A 125V)(S900:US, CND) | |
| SP901 | 1-504-671-11 | SPEAKER (WOOFER)(15cm) | |
| SP902 | 1-504-680-11 | SPEAKER (TWEETER)(2.2X10) (EX100/S900:E, JE) | |
| SP902 | 1-504-680-21 | SPEAKER (TWEETER)(2.2X10)(S900:US, CND) | |
| ⚠T901 | 1-427-744-11 | TRANSFORMER, POWER (S900:US, CND) | |
| ⚠T901 | 1-427-745-11 | TRANSFORMER, POWER (EX100:AEP, UK, G) | |
| ⚠T901 | 1-427-746-11 | TRANSFORMER, POWER (EX100:E, AUS/S900:E, JE) | |

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ACCESSORIES & PACKING MATERIALS

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| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| ⚠ | 1-575-706-31 | CORD, POWER (S900:US, CND) | |
| ⚠ | 1-765-293-11 | CORD, POWER (EX100:AEP, E, G, AUS) | |
| ⚠ | 1-769-312-11 | CORD, POWER (EX100:UK) | |
| | 1-769-329-11 | CORD, CONNECTION (PIN-PIN)(2.5m) | |
| ⚠ | 1-769-459-11 | CORD, POWER (S900:E, JE) | |
| | 3-701-940-01 | LABEL, BEAB (EX100:UK) | |
| | 3-798-348-11 | MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE, GERMAN, DUTCH, SWEDISH, ITALIAN, CHINESE, KOREAN, ARABIC) | |
| * | 4-971-160-01 | CUSHION (UPPER) | |
| * | 4-971-161-01 | CUSHION (LOWER) | |
| * | 4-972-595-01 | INDIVIDUAL CARTON (EX100:AEP, UK, G, AUS) | |
| * | 4-972-596-01 | INDIVIDUAL CARTON (EX100:E) | |
| * | 4-973-623-01 | INDIVIDUAL CARTON (S900:US, CND) | |
| * | 4-973-624-01 | INDIVIDUAL CARTON (S900:JE) | |
| * | 4-973-625-01 | INDIVIDUAL CARTON (S900:E) | |

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HARDWARE LIST

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| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| #1 | 7-621-849-50 | SCREW, WOOD +R 4.1X40 | |
| #2 | 7-685-134-19 | SCREW +P 2.6X8 TYPE2 NON-SLIT | |
| #3 | 7-685-147-19 | SCREW +P 3X10 TYPE2 NON-SLIT | |
| #4 | 7-682-548-04 | SCREW +BVTT 3X8 (S) | |
| #5 | 7-685-163-01 | SCREW +P 4X16 TYPE1 | |
| #6 | 7-685-650-79 | SCREW +BVTP 3X16 TYPE2 IT-3 | |
| #7 | 7-685-663-79 | SCREW +BVTP 4X16 TYPE2 IT-3 | |
| #8 | 7-685-647-79 | SCREW +BVTP 3X10 TYPE2 IT-3 | |
| #9 | 7-682-549-04 | SCREW +BVTT 3X10 (S) | |

| | |
|---|---|
| The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.<br>Replace only with part number specified. | Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.<br>Ne les remplacer que par une piéce portant le numéro spécifié. |

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
95A09110-1
Printed in Japan
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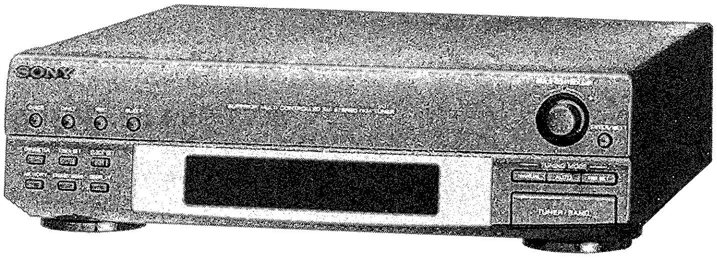
Published by Home A&V Products Div.
Quality Engineering Dept.

# ST-EX100

# SERVICE MANUAL

*AEP Model*
*UK Model*
*E Model*



This set is the tuner section in MHC-EX50/EX70AV/EX90/EX100AV.

**Photo : E mode (SILVER)**

## SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

***FM tuner section***

Tuning range 87.5 – 108.0 MHz (50 kHz step)
Aerial FM lead aerial
Aerial terminals 75 ohm unbalanced
Intermediate frequency 10.7 MHz

***AM tuner section***

Tuning range
- Italian model:
  - AM: 522 – 1,611 kHz (with the interval set at 9 kHz)
- German model:
  - AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
- E, Saudi Arabia, Thailand models:
  - AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
    530 – 1,710 kHz (with the interval set at 10 kHz)
- Other models:
  - MW: 531 – 1,602 kHz (with the interval set at 9 kHz)
  - LW: 153 – 279 kHz (with the interval set at 3 kHz)

Aerial AM loop aerial, External aerial terminals
Intermediate frequency 450 kHz
Dimensions Approx. 280 x 82.5 x 285 mm (11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d) incl. projecting parts and controls
Mass Approx. 1.5 kg (3 lb 4 oz)

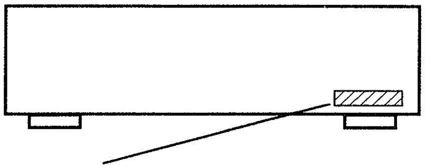
## FM STEREO/FM-AM TIMER TUNER

SONY®

使用時は添付資料も参照のこと
Refer to the additional documents.

## MODEL IDENTIFICATION

— Back Panel —



4-978-999-0□...E model
4-978-999-1□...AEP, UK, German, Italian, CIS model
(Made in France)
4-978-999-2□...AEP, UK model (Made in Malaysia)
4-978-999-3□...Saudi Arabia model
4-978-999-4□...Thailand model

## TABLE OF CONTENTS

Section Title Page

SECTION 1. SERVICING NOTE .................................. 3

SECTION 2. GENERAL ................................................ 4

SECTION 3. DISASSEMBLY
3-1. Panel Board ........................................................ 5
3-2. Back Panel, Main Board and Polar Board ....................... 5

SECTION 4. ELECTRICAL ADJUSTMENTS ................. 6

SECTION 5. DIAGRAMS
5-1. IC Block Diagrams ................................................ 8
5-2. Printed Wiring Board .......................................... 11
5-3. Schematic Diagram ............................................. 13
5-4. IC Pin Function
• IC201 System Control (µPD78013GC) ........................ 17

SECTION 6. EXPLODED VIEW ..................................... 19

SECTION 7. ELECTRICAL PARTS LIST ....................... 20

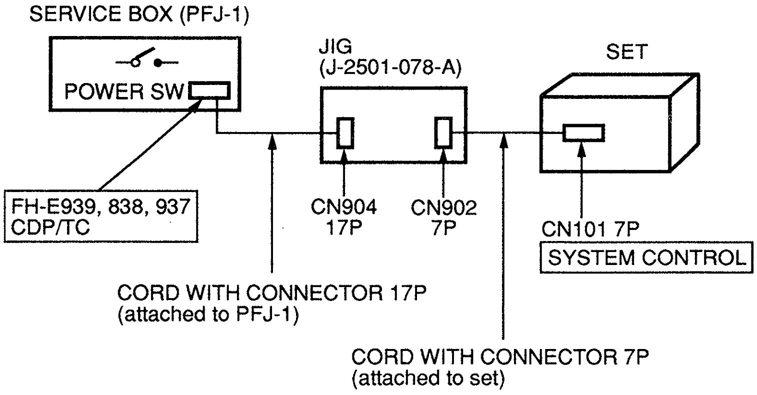
**SAFETY-RELATED COMPONENT WARNING !!**

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

# SECTION 1
# SERVICING NOTE

### How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ENTER/NEXT button and SLEEP button at the same time to turn the power on.


SERVICE BOX (PFJ-1)
POWER SW
FH-E939, 838, 937
CDP/TC
JIG
(J-2501-078-A)
CN904
17P
CN902
7P
SET
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

### • KEY/FL tube/LED check mode.

To enter KEY/FL/LED check mode, press the ENTER/NEXT and REC buttons at the same time.
Under mode, every time when press any key or turn MULTI CONTROLLER knob, change to next situation.

① All LED indicators light on
② All FL tube indicators light on
③ A part of FL tube light on mode 1. (Indicated ST-SEG)
④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
⑤ KEY check mode

**Note :**

1) All LED light on mode is keeped, when buttons which is pressed to enter all LED light on mode, release same time.
   When release them separate timing, it is moved to next All LED light on mode.

2) After all LED light on mode, light on point remove one by one, when any button pressed or MULTI CONTROLLER knob turned.

3) Under KEY check mode, every time buttons pressed numerical value of “KEY” in FL tube increse.
   And that time, numerical value of “ECDR” increse when MULTI CONTROLLER button turn to + direction, and it decrese turn to – direction.

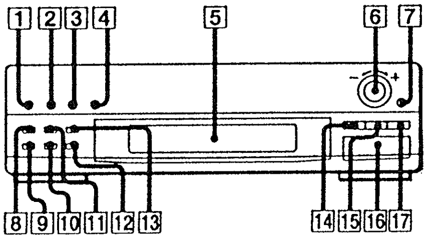
When you want to finish this mode, unplug the power of amplifire or turn off PFJ-1 of POWER switch.

# SECTION 2
# GENERAL

This section is extracted from instruction manual.

## Index to Parts and Controls

### Front Panel

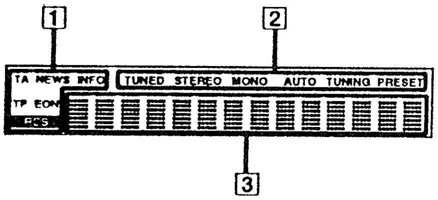


1 ONCE button* (25, 26)
2 DAILY button* (25, 26)
3 REC button* (26)
4 SLEEP button* (25)
5 Display window (6, 10, 25)
6 MULTI CONTROLLER*
(6, 10, 11, 13, 26)
7 ENTER/NEXT button* (6, 11, 26)
8 CHARACTER button (11)
9 EON (Enhanced Other Networks)
button (12) (AEP, UK, G, IT)
MEMORY button (E, EA, CIS,TH)
10 PTY (Programme Type) button (13)
(AEP, G, IT, UK)
STEREO/MONO button
(E, EA, CIS, TH)
11 TIMER SET button (25)
12 DISPLAY button (11, 12)
13 CLOCK SET button (6)
14 STEREO/MONO button (10)
MANUAL button (E, EA, CIS, TH)
15 TUNING MODE button (10)
(AEP, UK, G, IT)
AUTO button
(E, EA, CIS, TH)
16 TUNER/BAND button (10, 18, 30)
17 MEMORY button (11)
(AEP, UK, G, IT)
PRESET button (E, EA, CIS, TH)

- Abbreviation

| | |
|---|---|
| G | : German model. |
| IT | : Italian model. |
| EA | : Saudi Arabia model. |
| TH | : Thailand model |

### Display Window

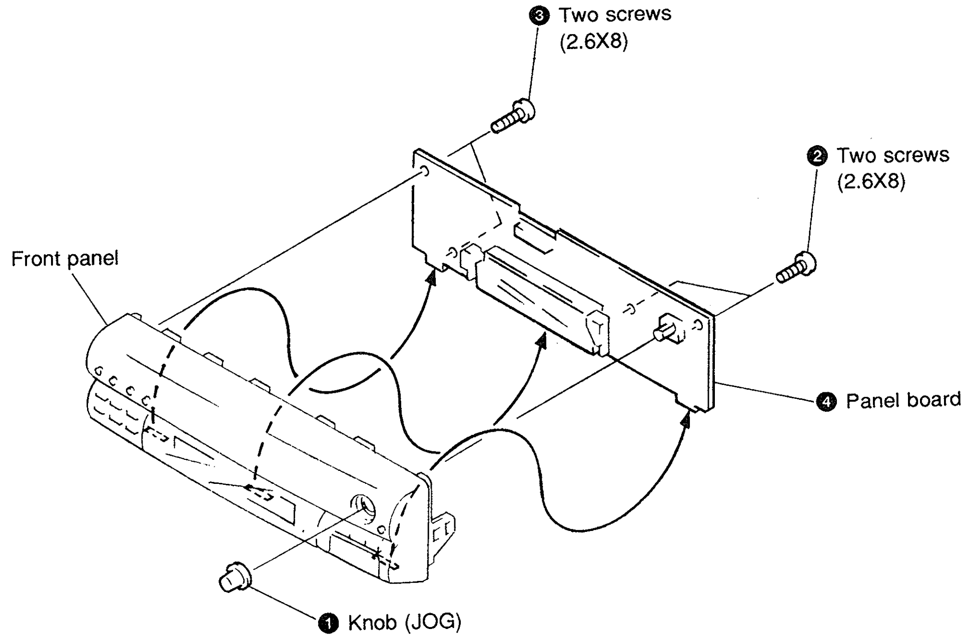


1 RDS service indications (12) (AEP, UK, G, IT)
2 Tuner indication (10)
3 Frequency/station name/time/timer
indication (6, 10, 11, 25)

# SECTION 3
# DISASSEMBLY

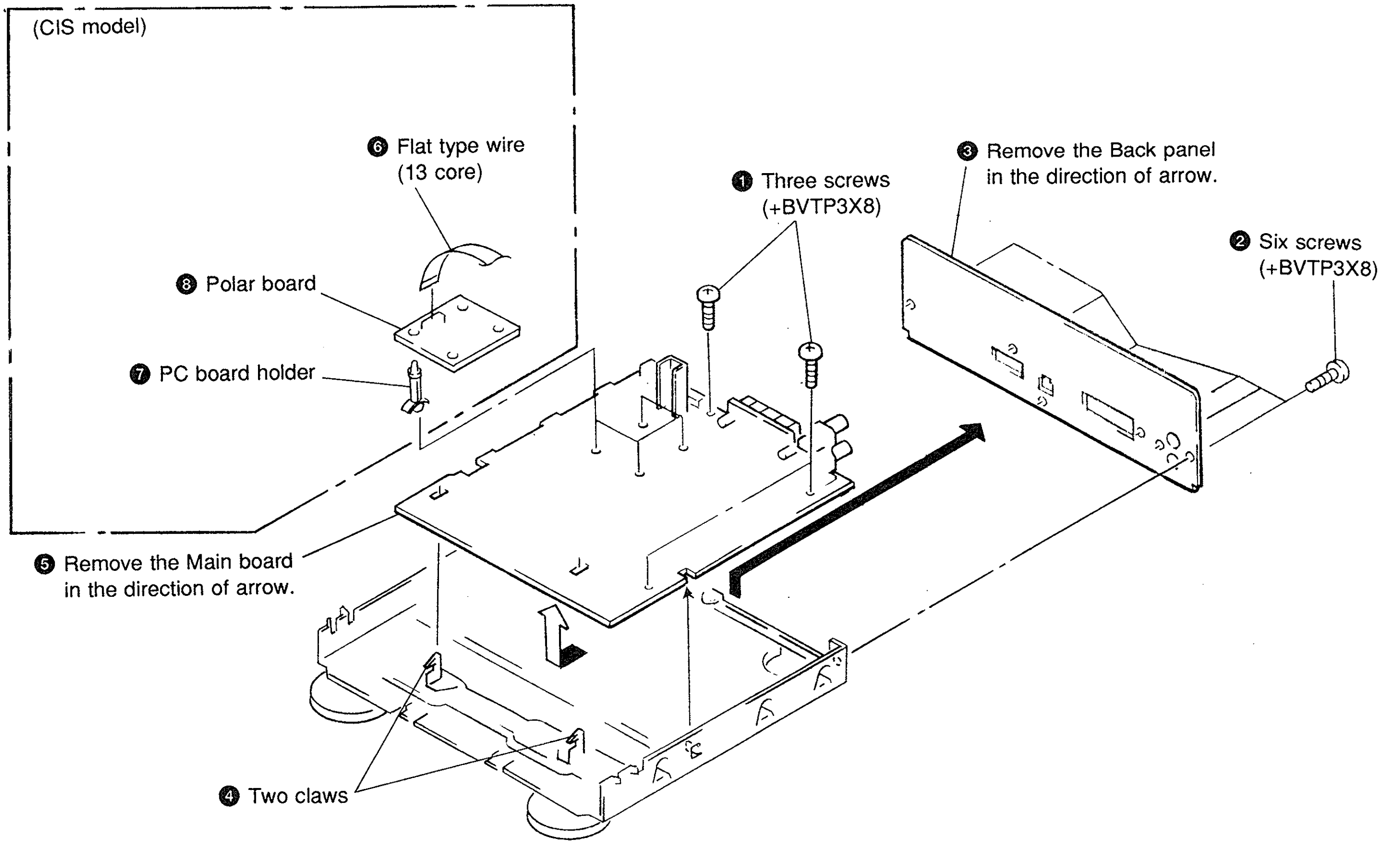
**Note :** Follow the disassembly procedure in the numerical order given.

## 3-1. PANEL BOARD



❸ Two screws (2.6X8)
❷ Two screws (2.6X8)
Front panel
❹ Panel board
❶ Knob (JOG)

## 3-2. BACK PANEL, MAIN BOARD AND POLAR BOARD



(CIS model)
❻ Flat type wire (13 core)
❽ Polar board
❼ PC board holder
❶ Three screws (+BVTP3X8)
❸ Remove the Back panel in the direction of arrow.
❷ Six screws (+BVTP3X8)
❺ Remove the Main board in the direction of arrow.
❹ Two claws

# SECTION 4

# ELECTRICAL ADJUSTMENTS

### Precautions in Repairing

If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

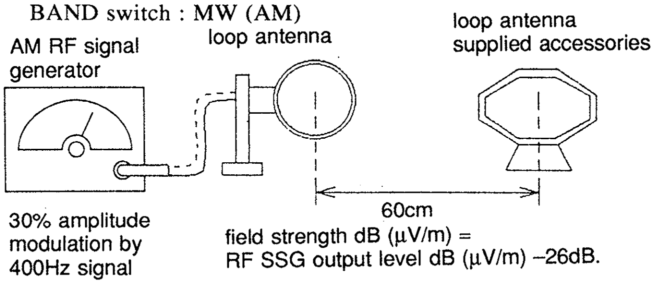
The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed.

## AM SECTION

### AM Tuning Level Adjustment

**Setting :**

BAND switch : MW (AM)


AM RF signal generator
loop antenna
loop antenna supplied accessories
60cm
30% amplitude modulation by 400Hz signal

field strength dB (µV/m) = RF SSG output level dB (µV/m) −26dB.

Carrier frequency : 999kHz (at 9k step)
1,000kHz (at 10k step)
Output level : 25dBµ

**Procedure :**

1. Set loop antenna A so that the loop antenna B input level becomes 55dBµ/m.
2. Tune the set to 999kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

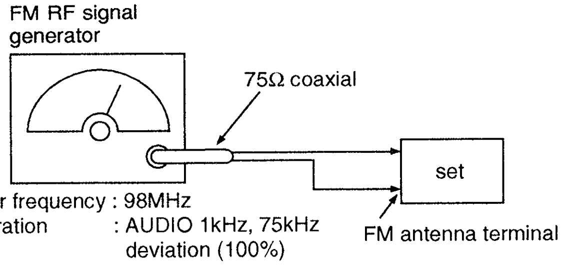
**Adjustment Location :** MAIN board. (See page 7)

## FM SECTION

### FM Tuning Level Adjustment

**Setting :**

BAND switch : FM


FM RF signal generator
75Ω coaxial
set
FM antenna terminal

Carrier frequency : 98MHz
Moduration : AUDIO 1kHz, 75kHz deviation (100%)
Output level : 26dBµ (17.8µV)

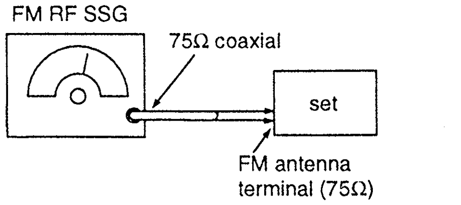
**Procedure :**

1. Tune the set to 98MHz.
2. Adjust RV2 so that the TUNED indicator goes on.

**Adjustment Location :** MAIN board. (See page 7)

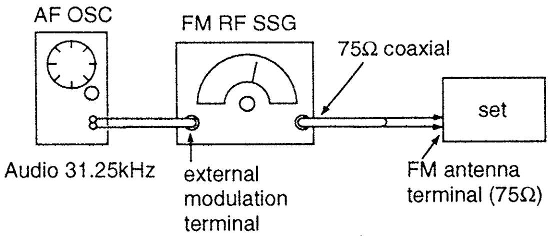
### FM Polar Adjustment (CIS model only)

**Connection 1 :**


FM RF SSG
75Ω coaxial
set
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBµ) (at 75Ω open)
Modulation : AUDIO 1kHz, 10kHz deviation

**Connection 2 :**


AF OSC
FM RF SSG
75Ω coaxial
set
Audio 31.25kHz
external modulation terminal
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBµ) (at 75Ω open)
Modulation : AUDIO 31.25kHz, 10kHz deviation (EXTERNAL MODULATION)

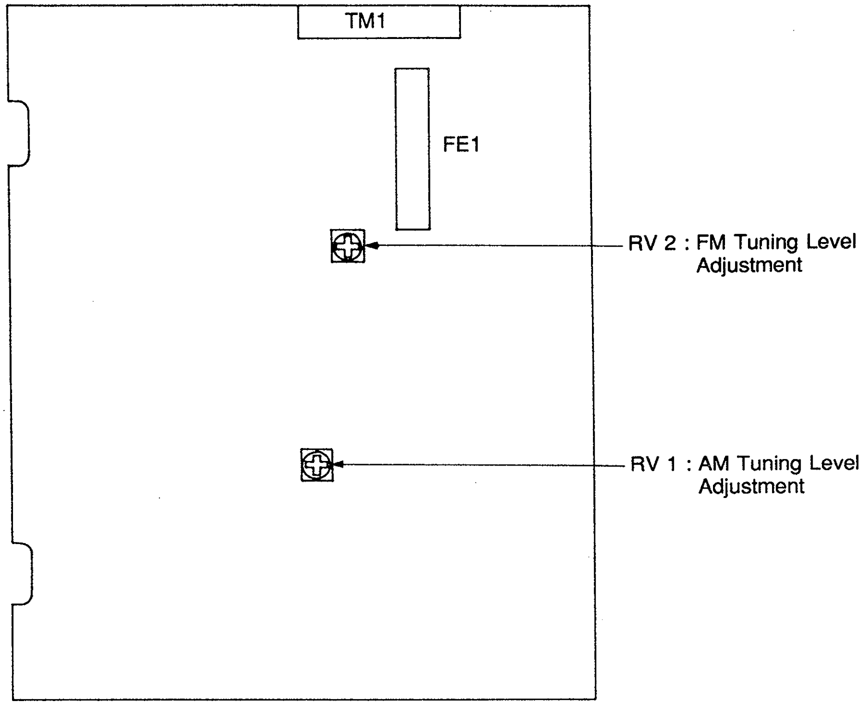
**Procedure :**

1. Set the modulation of FM RF SSG to AUDIO 1 kHz, 10 kHz deviation according to "Connection 1".
2. Tune the set to 69 MHz.
3. Adjust the RV1702 so that the reading of frequency counter connected to TP1702 becomes within 31.25 kHz ± 0.05 kHz. (VCO frequency adjustment)
4. Then record the reading of the level meter connected to TP1701.
5. Set the modulation of FM RF SSG to AUDIO 31.25 kHz, 10 kHz deviation according to "Connection 2".
6. Tune the set to 69 MHz.
7. Set the CT1701 to be mechanical center.
8. Adjust the L1701 so that the reading of the level meter connected to TP1701 becomes maximum.
   Then adjust the CT1701 so that the reading of the level meter connected to TP1701 becomes maximum. (SUB CARRIER PEAK Adjustment)
9. Adjust the RV1701 so that the level at the moment becomes 14 dB higher value than the level recorded in step 4. (SUB CARRIER LEVEL Adjustment)

**Adjustment Location :** Polar board. (See page 7)

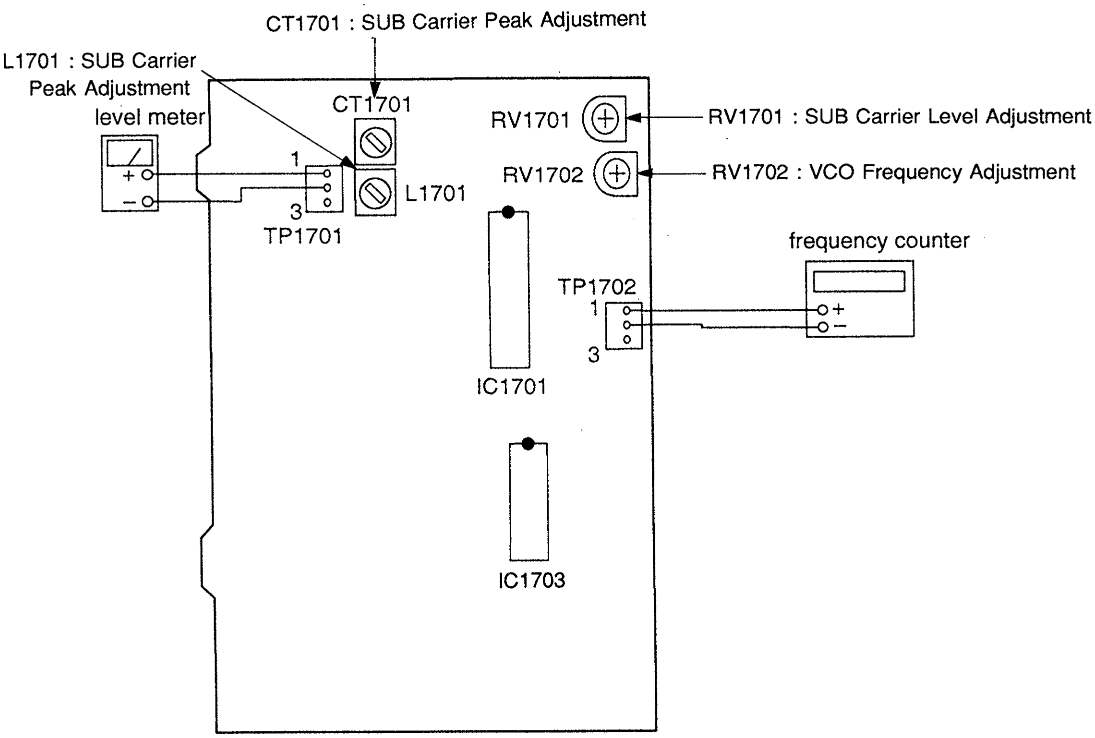
**Adjustment Location**

**[MAIN BOARD]** — Component side —



TM1
FE1
RV 2 : FM Tuning Level Adjustment
RV 1 : AM Tuning Level Adjustment

**[POLAR BOARD]** — Component side —

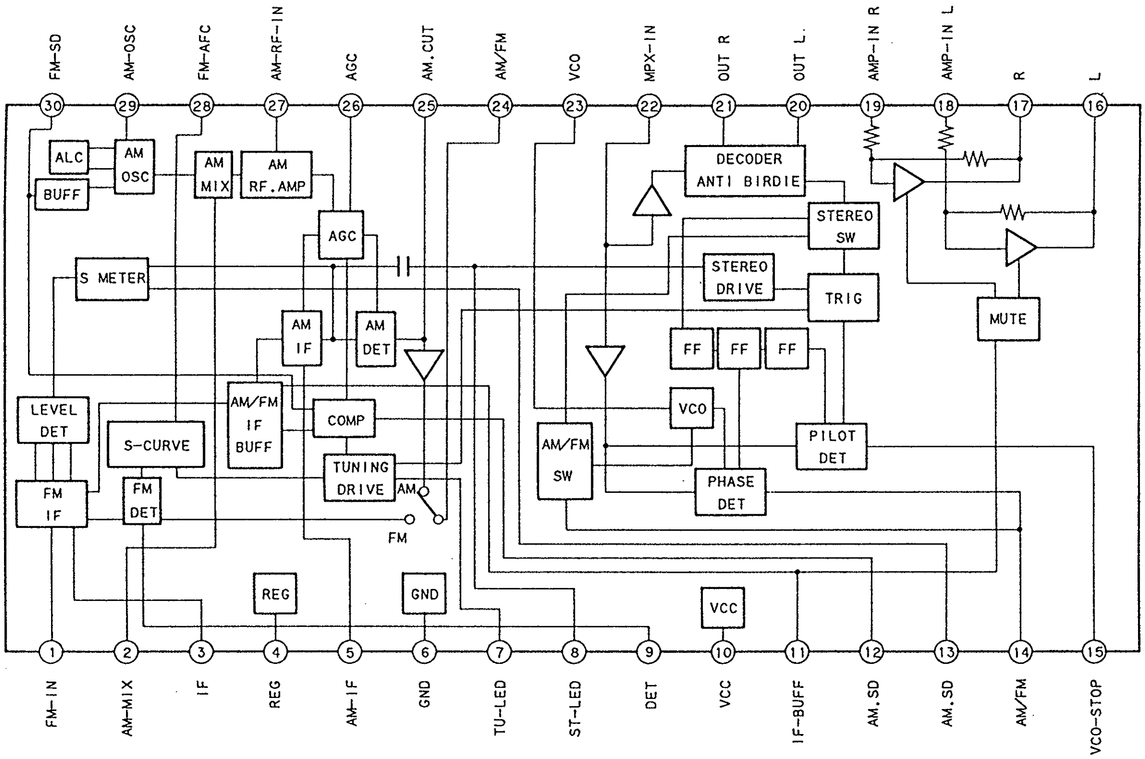


CT1701 : SUB Carrier Peak Adjustment
L1701 : SUB Carrier Peak Adjustment
level meter
+
−
1
3
TP1701
CT1701
L1701
RV1701
RV1702
RV1701 : SUB Carrier Level Adjustment
RV1702 : VCO Frequency Adjustment
frequency counter
TP1702
1
3
+
−
IC1701
IC1703

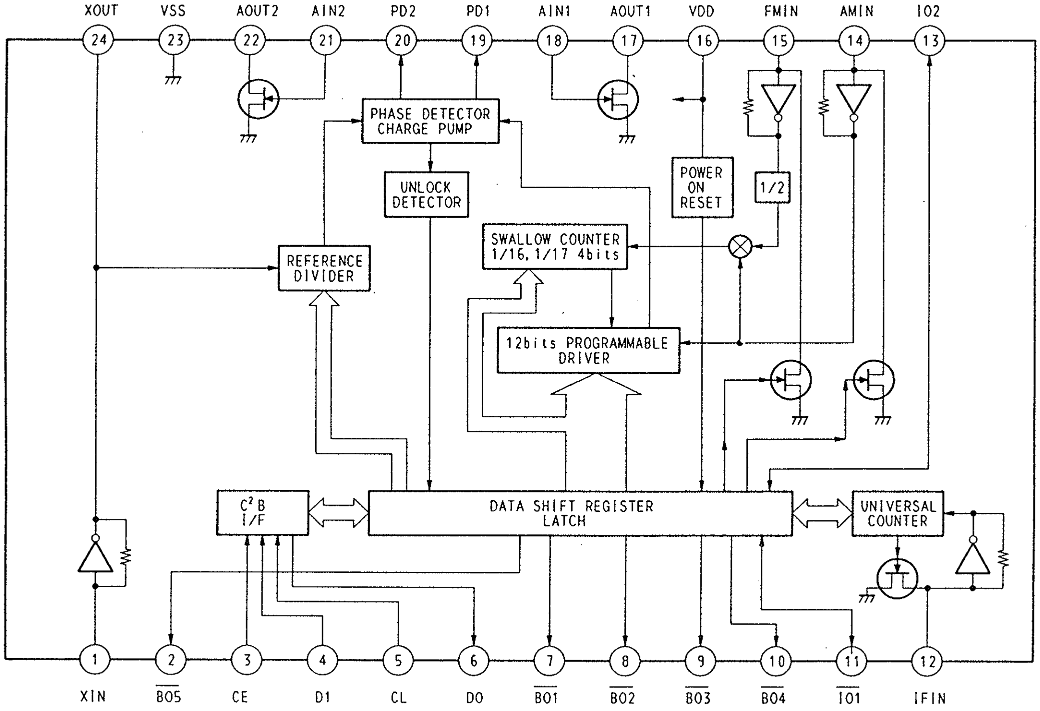
# SECTION 5
# DIAGRAMS

## 5-1. IC BLOCK DIAGRAMS

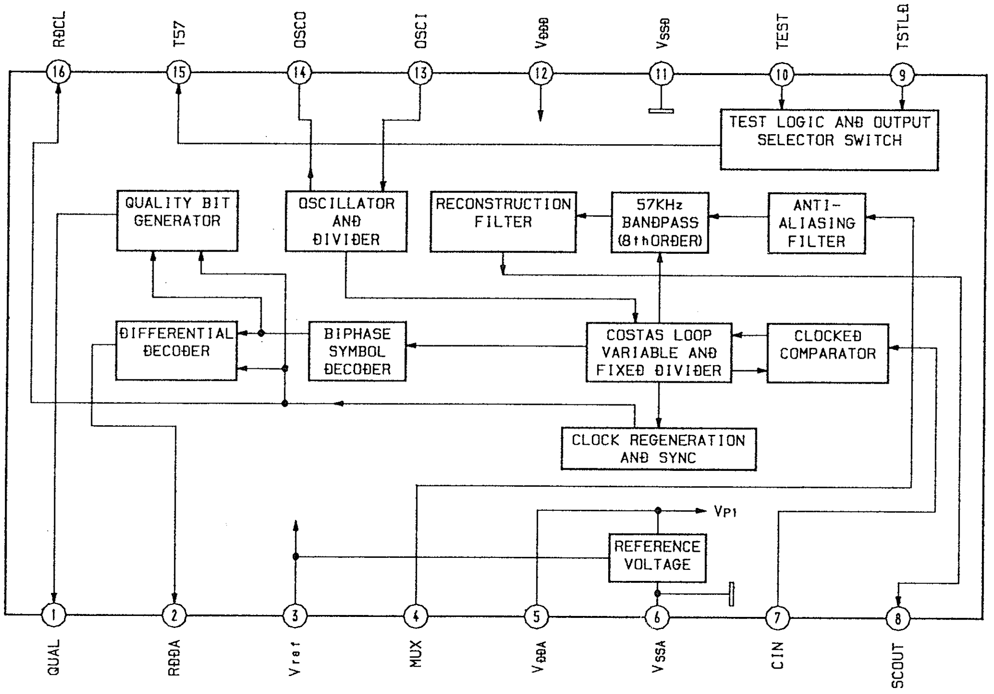
### IC1 LA1835


FM-SD
AM-OSC
FM-AFC
AM-RF-IN
AGC
AM.CUT
AM/FM
VCO
MPX-IN
OUT R
OUT L
AMP-IN R
AMP-IN L
R
L
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
ALC
AM OSC
BUFF
AM MIX
AM RF.AMP
AGC
S METER
AM IF
AM DET
LEVEL DET
S-CURVE
AM/FM IF BUFF
COMP
TUNING DRIVE
AM
FM
FM IF
FM DET
REG
GND
VCC
DECODER ANTI BIRDIE
STEREO SW
STEREO DRIVE
TRIG
FF
FF
FF
VCO
AM/FM SW
PHASE DET
PILOT DET
MUTE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
FM-IN
AM-MIX
IF
REG
AM-IF
GND
TU-LED
ST-LED
DET
VCC
IF-BUFF
AM.SD
AM.SD
AM/FM
VCO-STOP

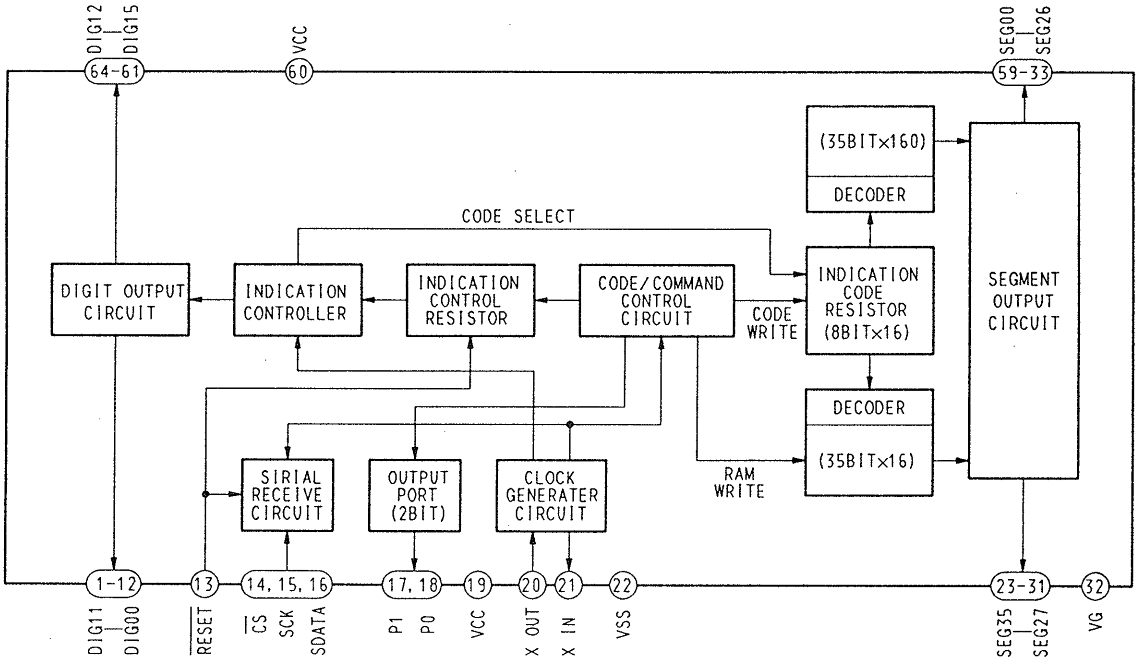
### IC51 LC72130


XOUT
VSS
AOUT2
AIN2
PD2
PD1
AIN1
AOUT1
VDD
FMIN
AMIN
IO2
24
23
22
21
20
19
18
17
16
15
14
13
PHASE DETECTOR CHARGE PUMP
UNLOCK DETECTOR
POWER ON RESET
1/2
REFERENCE DIVIDER
SWALLOW COUNTER 1/16, 1/17 4bits
12bits PROGRAMMABLE DRIVER
C²B I/F
DATA SHIFT REGISTER LATCH
UNIVERSAL COUNTER
1
2
3
4
5
6
7
8
9
10
11
12
XIN
BO5
CE
DI
CL
DO
BO1
BO2
BO3
BO4
IO1
IFIN

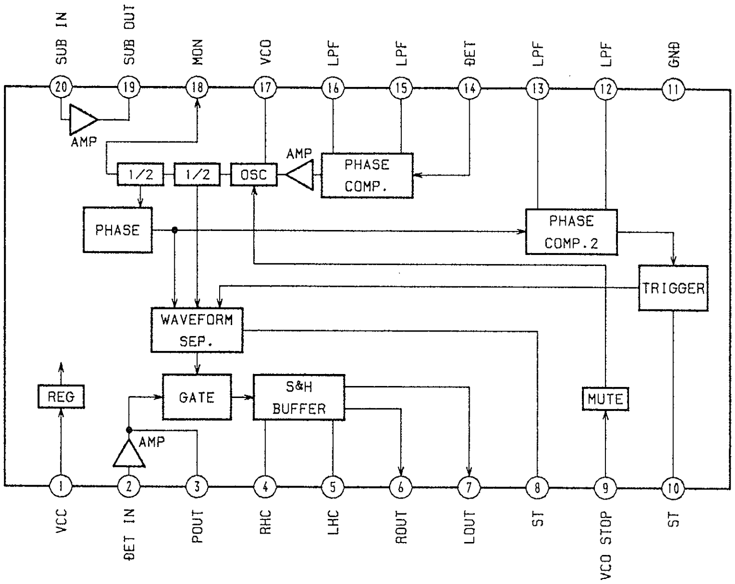
## IC302 SAA6579


RDCL
T57
OSCO
OSCI
VDDD
VSSD
TEST
TSTLD
16
15
14
13
12
11
10
9
TEST LOGIC AND OUTPUT SELECTOR SWITCH
QUALITY BIT GENERATOR
OSCILLATOR AND DIVIDER
RECONSTRUCTION FILTER
57KHz BANDPASS (8thORDER)
ANTI-ALIASING FILTER
DIFFERENTIAL DECODER
BIPHASE SYMBOL DECODER
COSTAS LOOP VARIABLE AND FIXED DIVIDER
CLOCKED COMPARATOR
CLOCK REGENERATION AND SYNC
VP1
REFERENCE VOLTAGE
1
2
3
4
5
6
7
8
QUAL
RDDA
Vref
MUX
VDDA
VSSA
CIN
SCOUT

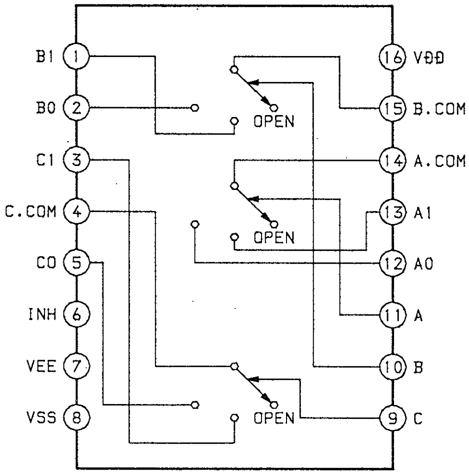
## IC601 M66004M6FP


DIG12—DIG15
64-61
VCC
60
SEG00—SEG26
59-33
(35BITx160)
DECODER
CODE SELECT
DIGIT OUTPUT CIRCUIT
INDICATION CONTROLLER
INDICATION CONTROL RESISTOR
CODE/COMMAND CONTROL CIRCUIT
CODE WRITE
INDICATION CODE RESISTOR (8BITx16)
SEGMENT OUTPUT CIRCUIT
DECODER
(35BITx16)
RAM WRITE
SIRIAL RECEIVE CIRCUIT
OUTPUT PORT (2BIT)
CLOCK GENERATER CIRCUIT
1-12
13
14, 15, 16
17, 18
19
20
21
22
23-31
32
DIG11—DIG00
RESET
CS
SCK
SDATA
P1
P0
VCC
X OUT
X IN
VSS
SEG35—SEG27
VG

## IC1701 IR3R42


SUB IN
SUB OUT
MON
VCO
LPF
LPF
ΦDET
LPF
LPF
GNΦ
20
19
18
17
16
15
14
13
12
11
AMP
AMP
1/2
1/2
OSC
PHASE COMP.
PHASE
PHASE COMP.2
TRIGGER
WAVEFORM SEP.
REG
GATE
S&H BUFFER
MUTE
AMP
1
2
3
4
5
6
7
8
9
10
VCC
ΦET IN
POUT
RHC
LHC
ROUT
LOUT
ST
VCO STOP
ST

## IC1703 MC14053BCP


B1 1
B0 2
C1 3
C.COM 4
C0 5
INH 6
VEE 7
VSS 8
16 VΦΦ
15 B.COM
14 A.COM
13 A1
12 A0
11 A
10 B
9 C
OPEN
OPEN
OPEN

**Note:**
- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- △ : internal component.
- ▭ : Pattern from the side which enable seeing.

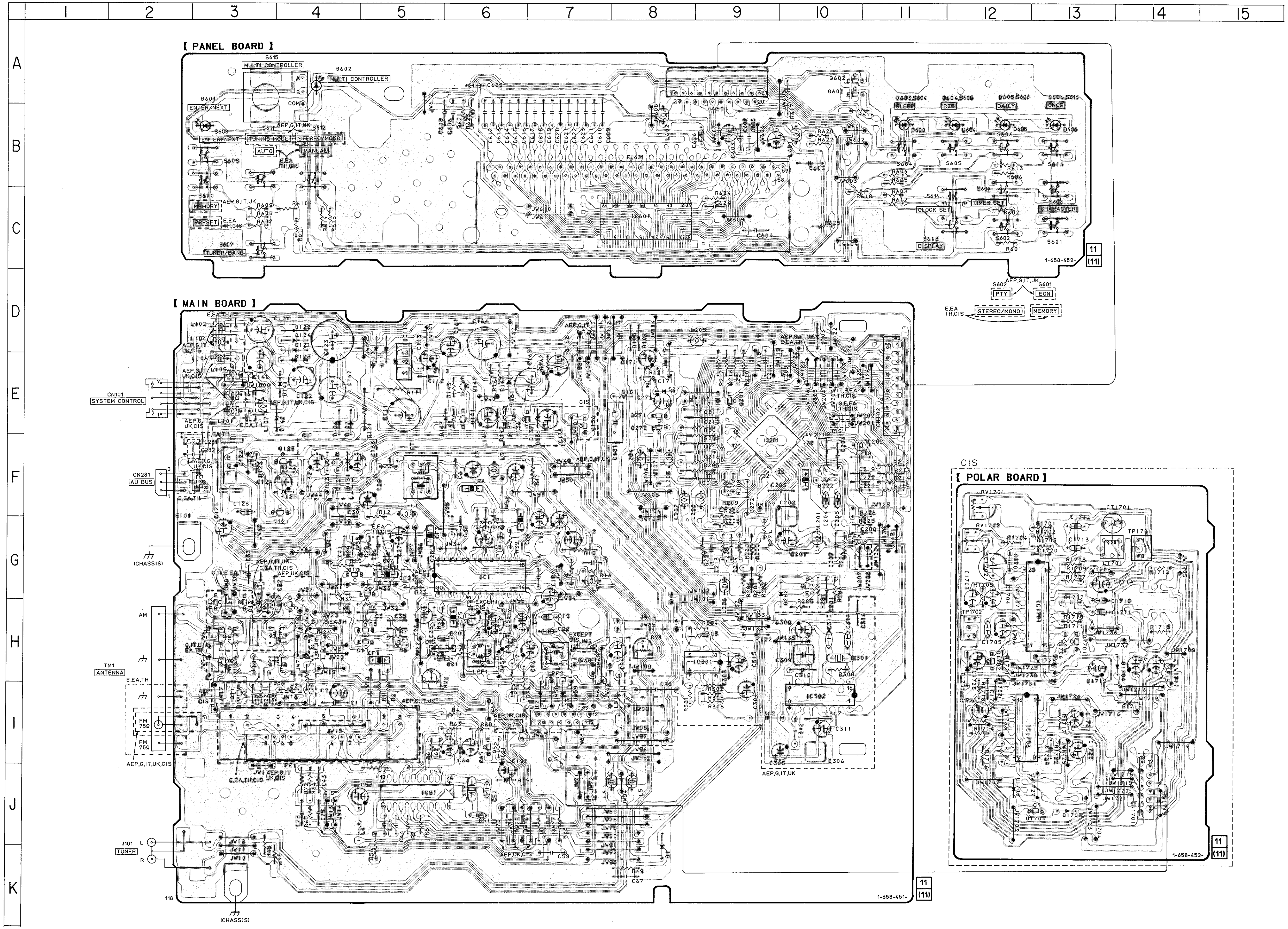
- Abbreviation

G : German model.
IT : Italian model.
EA : Saudi Arabia model.
TH : Thailand model.

## 5-2. PRINTED WIRING BOARD

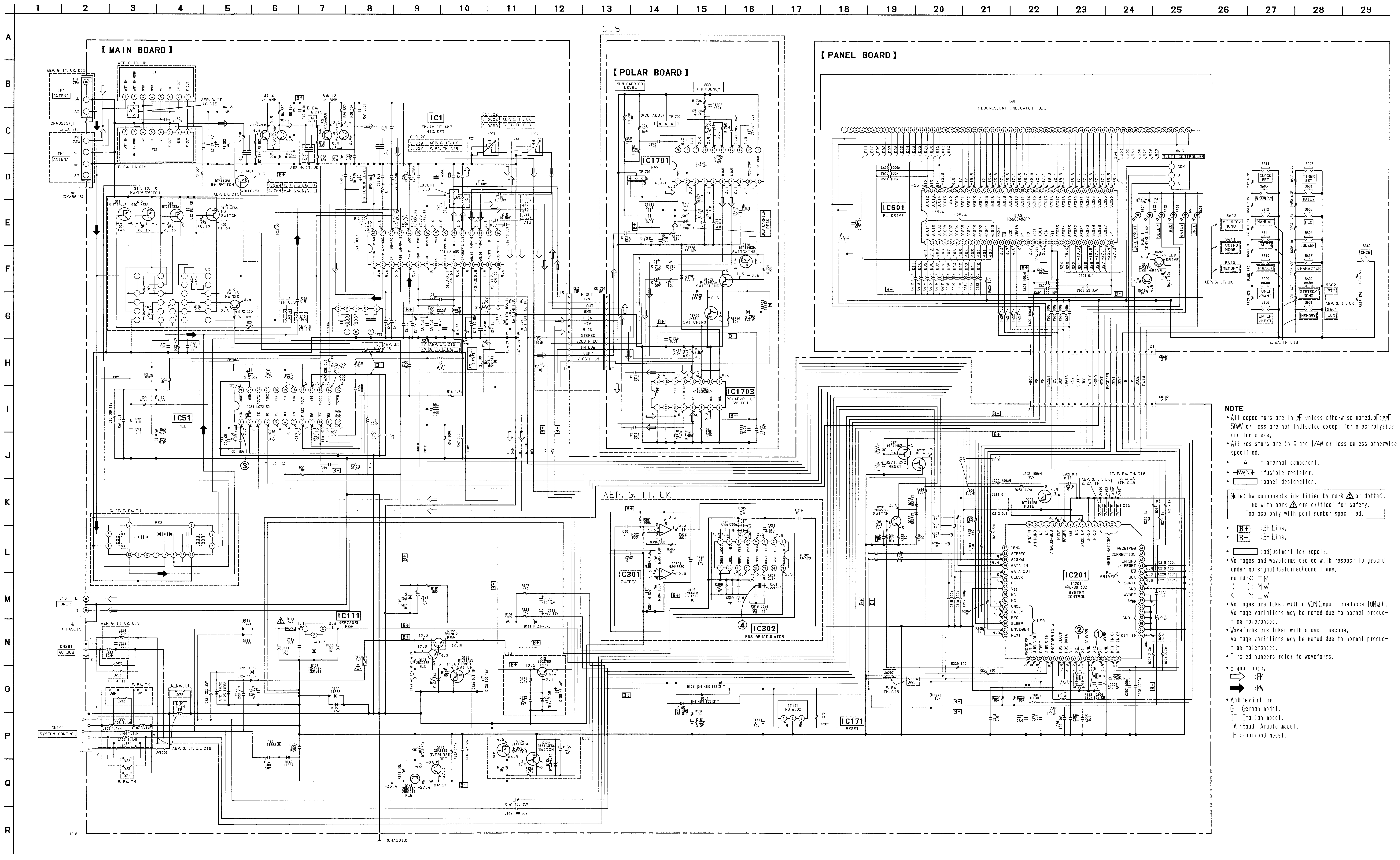
- **Semiconductor Location**

| Ref. No. | Location | Ref. No. | Location |
|---|---|---|---|
| D1 | K-8 | IC1 | G-6 |
| D2 | I-7 | IC51 | J-5 |
| D3 | I-7 | IC111 | E-5 |
| D102 | H-9 | IC171 | E-8 |
| D103 | D-10 | IC201 | F-9 |
| D104 | D-8 | IC301 | H-9 |
| D105 | D-8 | IC302 | I-10 |
| D111 | D-5 | IC601 | C-8 |
| D112 | D-5 | IC1701 | H-3 |
| D113 | E-5 | IC1703 | I-12 |
| D121 | E-4 | | |
| D122 | D-4 | Q1 | H-5 |
| D123 | E-4 | Q2 | H-5 |
| D124 | D-4 | Q9 | G-5 |
| D125 | F-4 | Q10 | G-4 |
| D126 | E-4 | Q11 | I-3 |
| D127 | E-4 | Q12 | H-3 |
| D131 | F-4 | Q13 | H-3 |
| D136 | E-7 | Q14 | H-4 |
| D141 | E-4 | Q15 | H-4 |
| D142 | E-4 | Q55 | I-6 |
| D143 | E-6 | Q121 | F-4 |
| D161 | E-6 | Q122 | F-3 |
| D191 | J-6 | Q123 | F-4 |
| D271 | E-8 | Q131 | F-4 |
| D281 | G-9 | Q136 | E-7 |
| D282 | G-10 | Q137 | E-7 |
| D601 | B-3 | Q141 | E-6 |
| D602 | A-4 | Q142 | E-6 |
| D603 | B-11 | Q201 | E-9 |
| D604 | B-12 | Q271 | E-8 |
| D605 | B-12 | Q272 | E-8 |
| D606 | B-13 | Q281 | G-10 |
| D1701 | H-12 | Q601 | A-10 |
| D1703 | J-12 | Q602 | A-10 |
| D1704 | H-14 | Q1701 | H-13 |
| D1705 | J-13 | Q1702 | H-12 |
| | | Q1704 | J-13 |


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
K
【 PANEL BOARD 】
【 MAIN BOARD 】
CIS
【 POLAR BOARD 】
CN101 SYSTEM CONTROL
CN281 AU BUS
TM1 ANTENNA
AM
FM 75Ω
J101 TUNER
(CHASSIS)
MULTI CONTROLLER
ENTER/NEXT
TUNING MODE
STEREO/MONO
AUTO
MANUAL
MEMORY
PRESET
TUNER/BAND
SLEEP
REC
DAILY
ONCE
TIMER SET
CLOCK SET
CHARACTER
DISPLAY
PTY
EON
IC1
IC51
IC201
IC301
IC302
IC601
IC1701
IC1703
1-658-452-
1-658-451-
1-658-453-
11
(11)

## 5-3. SCHEMATIC DIAGRAM

- See page 8 for IC Block Diagrams.
- See page 17 for IC Pin Function. (IC201)


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
A B C D E F G H I J K L M N O P Q R
【MAIN BOARD】
【POLAR BOARD】
【PANEL BOARD】
CIS
AEP, G, IT, UK
IC1 FM/AM IF AMP MIX, OSC
IC51 PLL
IC111
IC171 RESET
IC201 SYSTEM CONTROL
IC301 BUFFER
IC302 RDS DEMODULATOR
IC601 FL DRIVE
IC1701 MPX
IC1703 POLAR/PILOT SWITCH
FL601 FLUORESCENT INDICATOR TUBE
TM1 ANTENNA
J101 TUNER
CN261 AU BUS
CN101 SYSTEM CONTROL
SUB CARRIER LEVEL
VCO FREQUENCY
MULTI CONTROLLER
CLOCK SET
DISPLAY
MANUAL
AUTO
PRESET
TUNER /BAND
ENTER /NEXT
TIMER SET
DAILY
REC
SLEEP
CHARACTER
STEREO/MONO
MEMORY
EON
PTY
ONCE
TUNING MODE
(CHASSIS)

**NOTE**

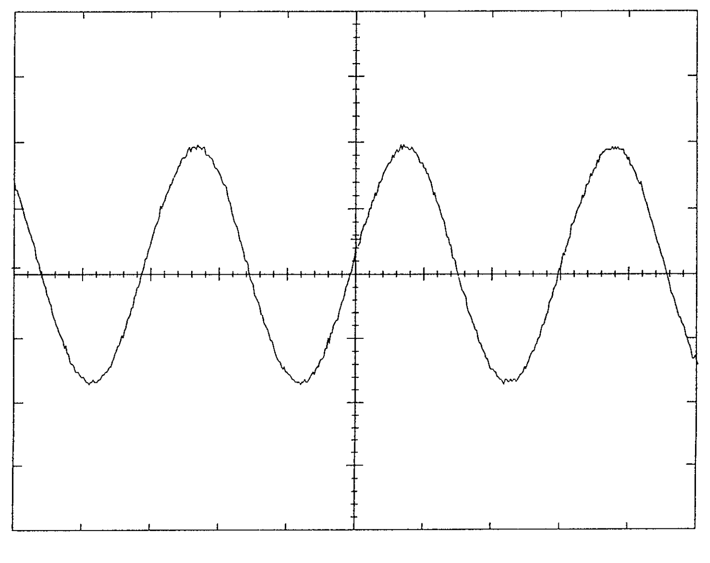
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- ⏛ : fusible resistor.
- ▭ : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

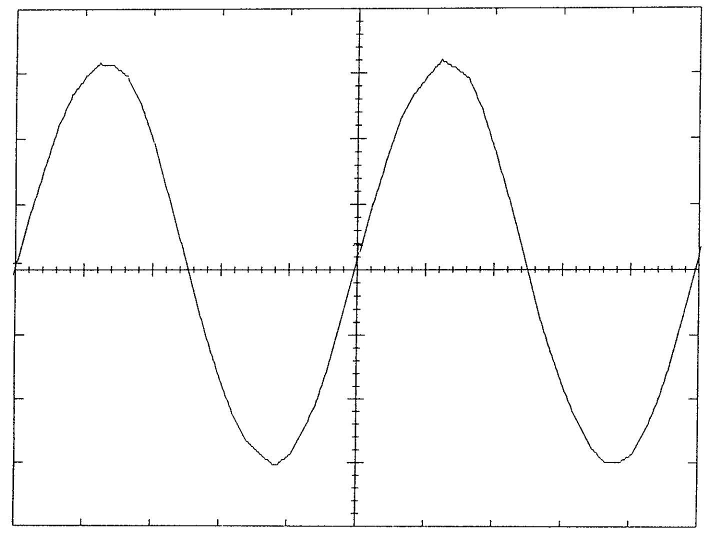
- B+ : B+ Line.
- B− : B− Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions.  
  no mark: FM  
  ( ): MW  
  < >: LW
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.  
  ⇨ : FM  
  ➡ : MW
- Abbreviation  
  G : German model.  
  IT : Italian model.  
  EA : Saudi Arabia model.  
  TH : Thailand model.

- **Waveforms**

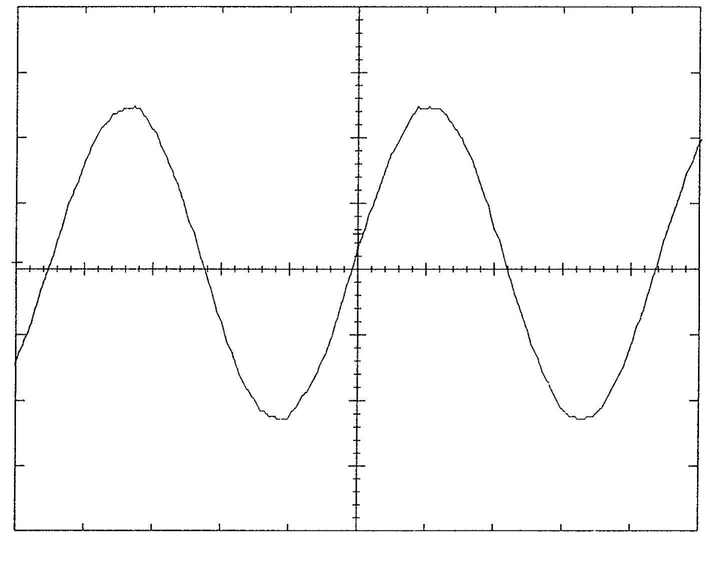
① IC201 ㊺ pin 1.8 Vp-p 32.768 kHz



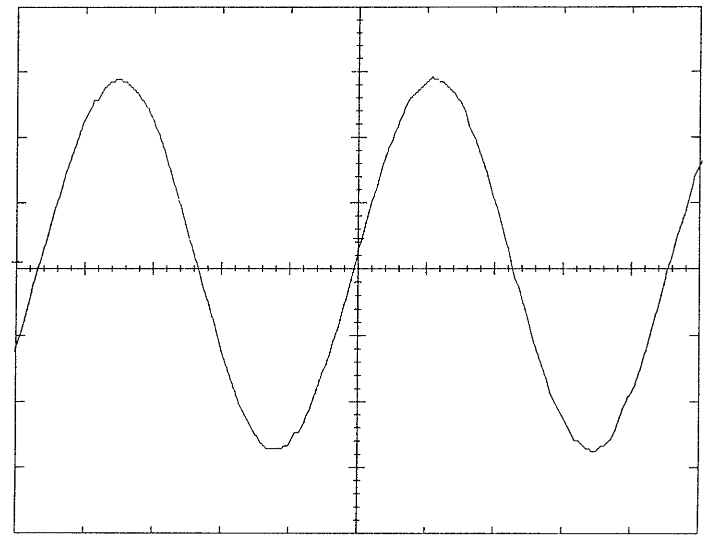
② IC201 ㊷ pin 3.1 Vp-p 10 MHz



③ IC51 ① pin 2.4 Vp-p 4.5 MHz



④ IC302 ⑬ pin 2.8 Vp-p 4.332 MHz



## 5-4. IC PIN FUNCTION

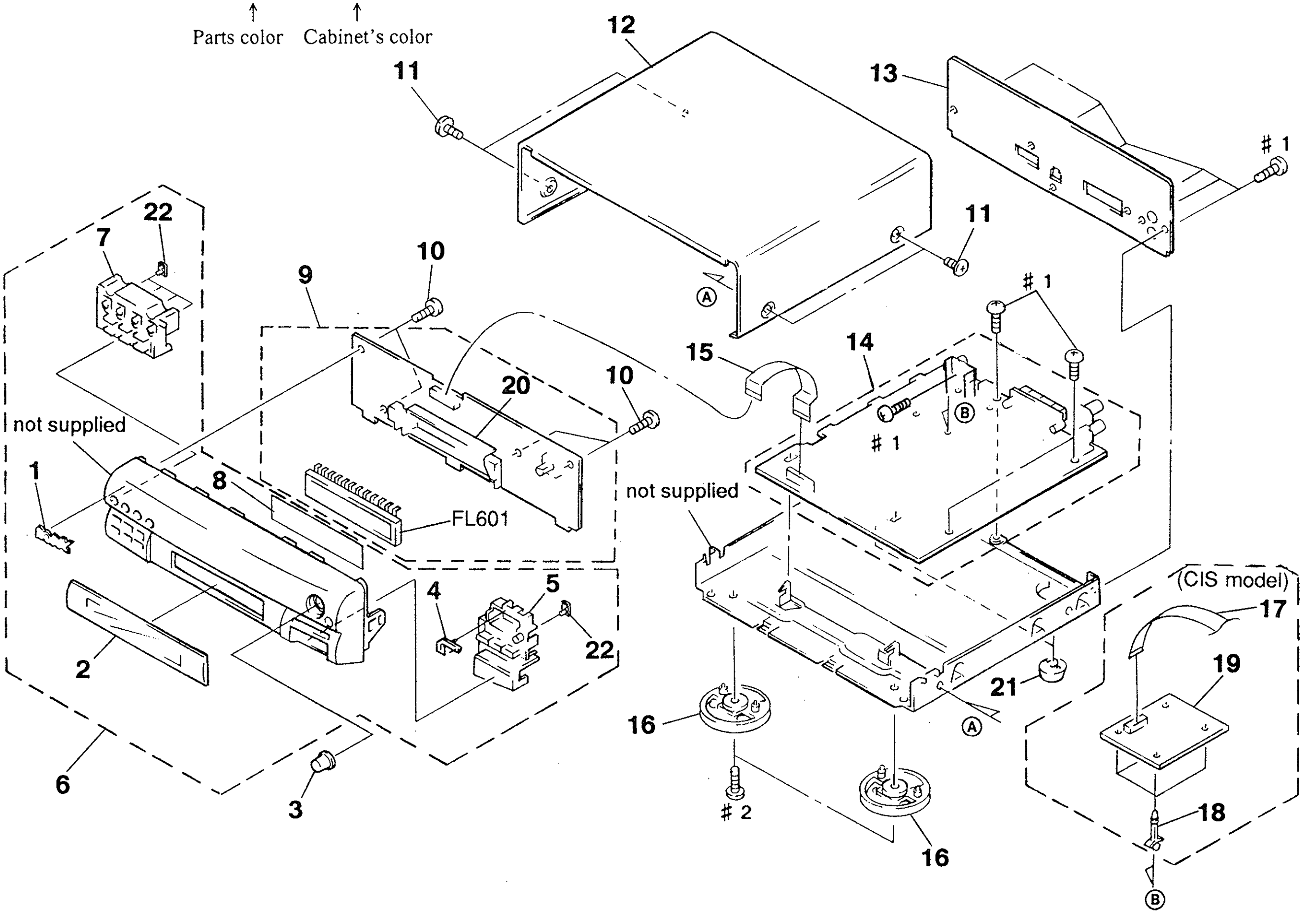
- **IC201 SYSTEM CONTROL ( μPD78013GC)**

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 1 | DESTINATION | I | Destination selection input. |
| 2 | DESTINATION | I | |
| 3 | DESTINATION | I | |
| 4 | DESTINATION | I | |
| 5 | IF +50 | I | Not used. (Ground) |
| 6 | IF –50 | O | |
| 7 | BACK UP | I | Back up mode input. |
| 8 | NC | – | Not used. (open) |
| 9 | Vss | – | Ground |
| 10 | $\overline{\text{POWER}}$ | O | Power ON/OFF switch control. |
| 11 | MUTE | O | Mute output. |
| 12 | ANALOG BUS | – | Not used. (open) |
| 13 | NC | – | |
| 14 | NC | – | |
| 15 | AM MONO | – | |
| 16 | AM/FM | – | |
| 17 | IFNG | – | |
| 18 | STEREO | I | STEREO signal input. |
| 19 | SIGNAL | I | TUNED signal input. |
| 20 | DATA IN | I | Data input. (LC72130, PLL) |
| 21 | DATA OUT | O | Data output. (LC72130, PLL) |
| 22 | CLOCK | O | Clock output. (LC72130, PLL) |
| 23 | CE | O | Chip Enable output. (LC72130, PLL) |
| 24 | Vss | – | Ground |
| 25 | NC | – | Not used. (open) |
| 26 | NC | – | |
| 27 | ONCE | O | LED drive output. |
| 28 | DAILY | O | |
| 29 | REC | O | |
| 30 | SLEEP | O | |
| 31 | ENCODER | O | |
| 32 | NEXT | O | |
| 33 | ENCODER IN B | I | ENCODER input. (B) |
| 34 | AU BUS OUT | O | Audio bus output. |
| 35 | RESET | I | SYSTEM RESET input. |
| 36 | AU BUS IN | I | Audio bus input. |
| 37 | ENCODER IN A | I | ENCODER input. (A) |
| 38 | RDS-CLOCK | I | RDS clock input. |
| 39 | RDS-DATA | I | RDS data input. |
| 40 | VDD | – | Power supply 5V. |

| Pin No. | Pin Name | I/O | Function |
|---|---|---|---|
| 41 | X2 | O | System main clock. (10 MHz) |
| 42 | X1 | I | |
| 43 | GND | – | Ground |
| 44 | XT2 | O | System sub clock. (32.768 kHz) |
| 45 | XT1 | I | |
| 46 | GND | – | Ground |
| 47 | KEY IN K1 | I | Key input. (analog) |
| 48 | KEY IN K2 | I | |
| 49 | KEY IN | I | |
| 50 | GND | – | Ground |
| 51 | GND | – | |
| 52 | GND | – | |
| 53 | GND | – | |
| 54 | GND | – | |
| 55 | AVDD | – | Analog power supply +5V. |
| 56 | AVREF | – | Analog system reference voltage input. |
| 57 | GND | – | Ground |
| 58 | SDATA | O | Fluorescent tube data output. (IC601) |
| 59 | SCK | O | Fluorescent tube clock output. (IC601) |
| 60 | $\overline{CS}$ | O | Fluorescent tube chip select signal output. (IC601) |
| 61 | RESET | O | Fluorescent tube reset signal output. (IC601) |
| 62 | ERRORS | I | Note used. (open) |
| 63 | CORRECTION | O | |
| 64 | RECEIVED | O | |

# SECTION 6
# EXPLODED VIEW

NOTE:
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | 4-962-708-11 | EMBLEM (4-A), SONY | |
| 2 | X-4946-909-1 | WINDOW (FL) ASSY (for SILVER) | |
| 2 | X-4946-912-1 | WINDOW (FL) ASSY (for BLACK) | |
| 3 | 4-977-680-11 | KNOB (JOG) (GRAY)... (SILVER) | |
| 3 | 4-977-680-21 | KNOB (JOG) (BLACK)... (BLACK) | |
| 4 | 4-977-705-11 | INDICATOR (JOG) | |
| 5 | 4-977-704-11 | BUTTON (BAND) (GRAY)... (SILVER) (AEP, UK, G, IT) | |
| 5 | 4-977-704-21 | BUTTON (BAND) (GRAY)... (SILVER) (E, CIS, EA, TH) | |
| 5 | 4-977-704-31 | BUTTON (BAND) (BLACK)... (BLACK) (AEP, UK, G, IT) | |
| 6 | X-4946-594-1 | PANEL ASSY (S), FRONT (SILVER) (E, EA) | |
| 6 | X-4946-834-1 | PANEL ASSY (BP), FRONT (BLACK) (AEP, UK, G, IT) | |
| 6 | X-4946-956-1 | PANEL ASSY (SP), FRONT (SILVER) (CIS, TH) | |
| 6 | X-4946-965-1 | PANEL ASSY (SP), FRONT (SILVER) (AEP, UK, G, IT) | |
| 7 | 4-977-703-11 | BUTTON (TIMER) (GRAY)... (SILVER) (AEP, UK, G, E, CIS, EA, TH) | |
| 7 | 4-977-703-21 | BUTTON (TIMER) (BLACK)... (BLACK) (AEP, UK, G, IT) | |
| 8 | 4-979-353-11 | FILTER (MD) | |
| * 9 | A-4378-851-A | PANEL BOARD, COMPLETE (E, EA, TH) | |
| * 9 | A-4378-864-A | PANEL BOARD, COMPLETE (AEP, UK, G, IT, CIS) | |
| 10 | 4-951-620-01 | SCREW (2.6X8), +BVTP | |
| 11 | 3-363-099-01 | SCREW (CASE 3 TP2) | |
| * 12 | 4-970-927-21 | CASE (BLACK) | |
| * 12 | 4-970-927-41 | CASE (SILVER) | |
| * 13 | 4-978-999-01 | PANEL, BACK (E) | |
| * 13 | 4-978-999-11 | PANEL, BACK (Made in France) (AEP, UK, G, IT, CIS) | |
| * 13 | 4-978-999-21 | PANEL, BACK (Made in Malaysia) (AEP, UK) | |
| * 13 | 4-978-999-31 | PANEL, BACK (EA) | |
| * 13 | 4-978-999-41 | PANEL, BACK (TH) | |
| * 14 | A-4378-850-A | MAIN BOARD, COMPLETE (E, EA, TH) | |
| * 14 | A-4378-863-A | MAIN BOARD, COMPLETE (AEP, UK) | |
| * 14 | A-4378-865-A | MAIN BOARD, COMPLETE (G) | |
| * 14 | A-4389-478-A | MAIN BOARD, COMPLETE (IT) | |
| * 14 | A-4389-479-A | MAIN BOARD, COMPLETE (CIS) | |
| 15 | 1-773-144-11 | WIRE (FLAT TYPE) (21 CORE) | |
| 16 | 4-977-699-11 | LEG (F) | |
| 17 | 1-751-688-11 | WIRE (FLAT TYPE) (13 CORE) (CIS) | |
| 18 | 4-924-098-91 | HOLDER, PC BOARD (CIS) | |
| * 19 | A-4389-480-A | POLAR BOARD, COMPLETE (CIS) | |
| * 20 | 4-979-798-01 | HOLDER (FL) | |
| 21 | 4-965-822-01 | FOOT | |
| 22 | 4-977-674-11 | INDICATOR (ENTER) | |
| FL601 | 1-517-368-11 | INDICATOR TUBE, FLUORESCENT | |

# SECTION 7
# ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| * | A-4378-863-A | MAIN BOARD, COMPLETE (AEP,UK) | |
| | | ***************************** | |
| * | A-4378-850-A | MAIN BOARD, COMPLETE (E,EA,TH) | |
| | | ****************************** | |
| * | A-4378-865-A | MAIN BOARD, COMPLETE (G) | |
| | | ************************ | |
| * | A-4389-478-A | MAIN BORAD, COMPLETE (IT) | |
| | | ************************* | |
| * | A-4389-479-A | MAIN BOARD, COMPLETE (CIS) | |
| | | ************************** | |
| | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | |
| | | < CAPACITOR > | |
| C1 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C2 | 1-126-967-11 | ELECT 47uF 20% 16V | |
| C3 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C4 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C5 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C6 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C7 | 1-126-967-11 | ELECT 47uF 20% 16V | |
| C8 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C9 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C10 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C11 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C12 | 1-124-902-00 | ELECT 0.47uF 20% 50V | |
| C13 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C14 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C15 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C16 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C17 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C18 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C19 | 1-136-160-00 | FILM 0.039uF 5% 50V | (AEP,G,IT,UK) |
| C19 | 1-136-158-00 | FILM 0.027uF 5% 50V | (E,EA,TH,CIS) |
| C20 | 1-136-160-00 | FILM 0.039uF 5% 50V | (AEP,G,IT,UK) |
| C20 | 1-136-158-00 | FILM 0.027uF 5% 50V | (E,EA,TH,CIS) |
| C21 | 1-137-389-11 | FILM 0.0022uF 5% 100V | (AEP,G,IT,UK) |
| C21 | 1-137-436-11 | FILM 0.0039uF 5% 50V | (E,EA,TH,CIS) |
| C22 | 1-137-389-11 | FILM 0.0022uF 5% 100V | (AEP,G,IT,UK) |
| C22 | 1-137-436-11 | FILM 0.0039uF 5% 50V | (E,EA,TH,CIS) |
| C23 | 1-124-903-11 | ELECT 1uF 20% 50V | |
| C24 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C25 | 1-162-600-11 | CERAMIC 0.0047uF 30% 16V | |
| C26 | 1-126-967-11 | ELECT 47uF 20% 16V | |
| C27 | 1-126-962-11 | ELECT 3.3uF 20% 50V | |
| C28 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C29 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C30 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C32 | 1-102-527-11 | CERAMIC 82PF 5% 50V | (AEP,UK,CIS) |
| C33 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C35 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C36 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C37 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C38 | 1-162-198-31 | CERAMIC 8.2PF 10% 50V | |
| C40 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C41 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C43 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C44 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C45 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C47 | 1-102-129-00 | CERAMIC 0.01uF 10% 50V | (E,EA,TH,CIS) |
| C51 | 1-102-518-11 | CERAMIC 33PF 5% 50V | |
| C52 | 1-102-959-00 | CERAMIC 22PF 5% 50V | |
| C53 | 1-126-964-11 | ELECT 10uF 20% 50V | |
| C54 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C55 | 1-126-933-11 | ELECT 100uF 20% 10V | |
| C56 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | |
| C58 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C64 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C65 | 1-126-933-11 | ELECT 100uF 20% 16V | |
| C67 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C71 | 1-124-925-11 | ELECT 2.2uF 20% 100V | |
| C73 | 1-164-159-21 | CERAMIC 0.1uF 50V | |
| C75 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | |
| C95 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C96 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | (CIS) |
| C111 | 1-126-952-11 | ELECT | 1000uF | 20% | 16V | |
| C112 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C113 | 1-126-933-11 | ELECT | 100uF | 20% | 10V | |
| C121 | 1-104-666-11 | ELECT | 220uF | 20% | 25V | |
| C122 | 1-104-666-11 | ELECT | 220uF | 20% | 25V | |
| C123 | 1-126-951-11 | ELECT | 470uF | 20% | 35V | |
| C124 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | |
| C125 | 1-126-933-11 | ELECT | 100uF | 20% | 16V | |
| C126 | 1-136-165-00 | FILM | 0.1uF | 5% | 50V | |
| C132 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (CIS) |
| C133 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (CIS) |
| C136 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (CIS) |
| C141 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C142 | 1-126-968-11 | ELECT | 100uF | 20% | 50V | |
| C145 | 1-126-967-11 | ELECT | 47uF | 20% | 50V | |
| C161 | 1-126-948-11 | ELECT | 100uF | 20% | 35V | |
| C162 | 1-126-948-11 | ELECT | 100uF | 20% | 35V | |
| C163 | 1-126-935-11 | ELECT | 470uF | 20% | 16V | |
| C164 | 1-126-935-11 | ELECT | 470uF | 20% | 16V | |
| C171 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| C181 | 1-125-705-11 | CAPACITOR | 0.22F | 0 | 5.5V | |
| C191 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | |
| C201 | 1-126-933-11 | ELECT | 100uF | 20% | 10V | |
| C202 | 1-136-177-00 | FILM | 1uF | 5% | 50V | |
| C203 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C204 | 1-102-953-00 | CERAMIC | 18PF | 5% | 50V | |
| C205 | 1-102-960-00 | CERAMIC | 24PF | 5% | 50V | |
| C206 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C207 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C208 | 1-162-294-31 | CERAMIC | 0.001uF | 10% | 50V | |
| C209 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C210 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C211 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C212 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C213 | 1-162-306-11 | CERAMIC | 0.01uF | 30% | 16V | |
| C214 | 1-162-306-11 | CERAMIC | 0.01uF | 30% | 16V | |
| C215 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C216 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C217 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C218 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C219 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C220 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C221 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C271 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | |
| C272 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | |
| C281 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | |
| C282 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V | (AEP, G, IT, UK, CIS) |
| C301 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | (AEP, G, IT, UK) |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C302 | 1-162-288-31 | CERAMIC | 330PF | 10% | 50V | (AEP, G, IT, UK) |
| C303 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | (AEP, G, IT, UK) |
| C304 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | (AEP, G, IT, UK) |
| C305 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (AEP, G, IT, UK) |
| C306 | 1-136-177-00 | FILM | 1uF | 5% | 50V | (AEP, G, IT, UK) |
| C307 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | (AEP, G, IT, UK) |
| C308 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (AEP, G, IT, UK) |
| C309 | 1-136-177-00 | FILM | 1uF | 5% | 50V | (AEP, G, IT, UK) |
| C310 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | (AEP, G, IT, UK) |
| C311 | 1-124-925-11 | ELECT | 2.2uF | 20% | 100V | (AEP, G, IT, UK) |
| C312 | 1-162-291-31 | CERAMIC | 560PF | 10% | 50V | (AEP, G, IT, UK) |
| C313 | 1-101-884-00 | CERAMIC | 56PF | 5% | 50V | (AEP, G, IT, UK) |
| C314 | 1-101-884-00 | CERAMIC | 56PF | 5% | 50V | (AEP, G, IT, UK) |
| C315 | 1-126-967-11 | ELECT | 47uF | 20% | 16V | (AEP, G, IT, UK) |
| C316 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V | (AEP, G, IT, UK) |

< FILTER >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| CF1 | 1-579-374-71 | FILTER, CERAMIC | (AEP, G, IT, UK) |
| CF1 | 1-567-389-11 | FILTER, CERAMIC | (E, EA, TH, CIS) |
| CF2 | 1-760-393-11 | FILTER, CERAMIC | (AEP, G, IT, UK) |
| CF3 | 1-760-393-11 | FILTER, CERAMIC | (AEP, G, IT, UK) |
| CF3 | 1-567-389-11 | FILTER, CERAMIC | (E, EA, TH, CIS) |
| CF4 | 1-527-981-00 | FILTER, CERAMIC | |
| CF5 | 1-577-075-11 | OSCILLATOR, CERAMIC | |
| CF6 | 1-760-220-11 | FILTER, CERAMIC | |

< CONNECTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * CN2 | 1-568-832-11 | SOCKET, CONNECTOR 13P | (CIS) |
| CN101 | 1-770-158-21 | HOUSING, CONNECTOR 7P | (SYSTEM CONTROL) |
| CN102 | 1-568-838-11 | SOCKET, CONNECTOR 21P | |
| * CN281 | 1-565-561-11 | PIN, CONNECTOR 3P | (AU BUS) |

< DIODE >

| Ref. No. | Part No. | Description | | Remark |
|---|---|---|---|---|
| D1 | 8-719-815-85 | DIODE | 1S1585 | |
| D2 | 8-719-815-85 | DIODE | 1S1585 | |
| D3 | 8-719-815-85 | DIODE | 1S1585 | (CIS) |
| D102 | 8-719-815-85 | DIODE | 1S1585 | (AEP, G, IT, UK) |
| D103 | 8-719-815-85 | DIODE | 1S1585 | |

# MAIN

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| D104 | 8-719-815-85 | DIODE 1S1585 | |
| D105 | 8-719-815-85 | DIODE 1S1585 | |
| D111 | 8-719-200-82 | DIODE 11ES2 | |
| D112 | 8-719-200-82 | DIODE 11ES2 | |
| D113 | 8-719-815-85 | DIODE 1S1585 | |
| D121 | 8-719-200-82 | DIODE 11ES2 | |
| D122 | 8-719-200-82 | DIODE 11ES2 | |
| D123 | 8-719-200-82 | DIODE 11ES2 | |
| D124 | 8-719-200-82 | DIODE 11ES2 | |
| D125 | 8-719-110-31 | DIODE RD12ES-B2 | |
| D126 | 8-719-200-82 | DIODE 11ES2 | |
| D127 | 8-719-200-82 | DIODE 11ES2 | |
| D131 | 8-719-921-63 | DIODE MTZJ-7.5B (CIS) | |
| D136 | 8-719-109-97 | DIODE RD6.8ES-B2 (CIS) | |
| D141 | 8-719-200-82 | DIODE 11ES2 | |
| D142 | 8-719-200-82 | DIODE 11ES2 | |
| D143 | 8-719-982-19 | DIODE MTZJ-30A | |
| D161 | 8-719-010-34 | DIODE UZ-4.7BSC | |
| D191 | 8-719-109-88 | DIODE RD5.6ES-B1 | |
| D271 | 8-719-815-85 | DIODE 1S1585 | |
| D281 | 8-719-815-85 | DIODE 1S1585 | |
| D282 | 8-719-815-85 | DIODE 1S1585 | |

< FRONTEND >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| FE1 | 1-693-253-21 | FRONT END (4 GANG) (AEP,G,IT,UK) | |
| FE1 | 1-693-090-51 | FRONT END (FM) (2 GANG) (E,EA,TH) | |
| FE1 | 1-693-244-21 | FRONT END (3 GANG) (CIS) | |
| FE2 | 1-233-514-11 | ENCAPSULATED COMPONENT (AEP,UK,CIS) | |
| FE2 | 1-239-634-11 | ENCAPSULATED COMPONENT, AM.RF (G,IT,E,EA,TH) | |

< IC >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| IC1 | 8-759-176-03 | IC LA1835 | |
| IC51 | 8-759-288-54 | IC LC72130 | |
| IC111 | 8-759-231-53 | IC TA7805S | |
| IC171 | 8-759-165-80 | IC PST600C-T | |
| IC201 | 8-759-338-81 | IC uPD78013GC-652-AB8 | |
| IC301 | 8-759-634-51 | IC M5218AP (AEP,G,IT,UK) | |
| IC302 | 8-759-169-99 | IC SAA6579 (AEP,G,IT,UK) | |

< IFT >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| IFT1 | 1-409-636-11 | TRANSFORMER, IF(CERAMIC FILTER) | |

< JACK >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| J101 | 1-770-272-11 | JACK, PIN 2P (TUNER) | |

< COIL >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| L1 | 1-407-500-00 | INDUCTOR 4.7mH (AEP,UK,CIS) | |
| L1 | 1-410-688-31 | INDUCTOR 1.5mH (G,IT,E,EA,TH) | |
| L3 | 1-414-183-41 | INDUCTOR 10uH | |
| L4 | 1-410-509-11 | INDUCTOR 10uH | |
| L5 | 1-410-397-21 | FERRITE BEAD INDUCTOR | |
| L6 | 1-410-397-21 | FERRITE BEAD INDUCTOR | |
| L7 | 1-410-397-21 | FERRITE BEAD INDUCTOR | |
| L9 | 1-410-509-11 | INDUCTOR 10uH (CIS) | |
| L10 | 1-414-183-41 | INDUCTOR 10uH (AEP,G,IT,UK) | |
| L101 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L102 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L103 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L104 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L105 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L106 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L107 | 1-410-397-21 | FERRITE BEAD INDUCTOR (AEP,G,IT,UK,CIS) | |
| L201 | 1-414-189-31 | INDUCTOR 100uH | |
| L202 | 1-414-189-31 | INDUCTOR 100uH | |
| L203 | 1-410-521-11 | INDUCTOR 100uH | |
| L204 | 1-410-521-11 | INDUCTOR 100uH | |
| L205 | 1-410-521-11 | INDUCTOR 100uH | |
| L206 | 1-410-521-11 | INDUCTOR 100uH | |
| L207 | 1-410-521-11 | INDUCTOR 100uH | |
| L208 | 1-410-521-11 | INDUCTOR 100uH | |
| L281 | 1-410-509-11 | INDUCTOR 10uH (AEP,G,IT,UK,CIS) | |
| L282 | 1-410-509-11 | INDUCTOR 10uH (AEP,G,IT,UK,CIS) | |

< FILTER >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| LPF1 | 1-239-597-11 | FILTER, LOW PASS | |
| LPF2 | 1-239-597-11 | FILTER, LOW PASS | |

< TRANSISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| Q1 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q2 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q9 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q10 | 8-729-230-99 | TRANSISTOR 2SC2669-OY | |
| Q11 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP,UK,CIS) | |
| Q12 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP,UK,CIS) | |
| Q13 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP,UK,CIS) | |
| Q14 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (AEP,UK,CIS) | |
| Q15 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE (AEP,UK,CIS) | |
| Q55 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP | |
| Q121 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q122 | 8-729-209-15 | TRANSISTOR 2SD2012 | |
| Q123 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP | |
| Q131 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE (CIS) | |
| Q136 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP (CIS) | |
| Q137 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP (CIS) | |
| Q141 | 8-729-118-00 | TRANSISTOR 2SB1116-L | |
| Q142 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| Q201 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP | |
| Q271 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP | |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| Q272 | 8-729-029-67 | TRANSISTOR | DTC114ESA-TP | | | |
| Q281 | 8-729-119-78 | TRANSISTOR | 2SC2785-HFE | | | |
| | | < RESISTOR > | | | | |
| R1 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R2 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R3 | 1-247-815-91 | CARBON | 220 | 5% | 1/4W | |
| R4 | 1-249-402-11 | CARBON | 56 | 5% | 1/4W | |
| R5 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R6 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R7 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R8 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R11 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R12 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R13 | 1-249-442-11 | CARBON | 510 | 5% | 1/4W | |
| R14 | 1-249-403-11 | CARBON | 68 | 5% | 1/4W | |
| R15 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R16 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R17 | 1-247-842-11 | CARBON | 3K | 5% | 1/4W | |
| R18 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R19 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R21 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R22 | 1-249-437-11 | CARBON | 47K | 5% | 1/4W | |
| R23 | 1-249-399-11 | CARBON | 33 | 5% | 1/4W | |
| R24 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | (AEP, UK, CIS) |
| R25 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | (AEP, UK, CIS) |
| R28 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R29 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R35 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R36 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R37 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R38 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W | |
| R39 | 1-249-393-11 | CARBON | 10 | 5% | 1/4W | (AEP, UK, CIS) |
| R39 | 1-249-401-11 | CARBON | 47 | 5% | 1/4W | (G, IT, E, EA, TH) |
| R45 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R46 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R49 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R51 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R56 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R58 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R60 | 1-249-405-11 | CARBON | 100 | 5% | 1/4W | |
| R61 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R62 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R63 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R64 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R65 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |

| Ref. No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R70 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | (AEP, UK, CIS) |
| R71 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R72 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| ⚠R111 | 1-217-641-00 | FUSIBLE | 4.7 | 5% | 1/4W | F |
| ⚠R121 | 1-217-642-81 | FUSIBLE | 6.8 | 5% | 1/4W | F |
| R122 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R123 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R131 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | (CIS) |
| R136 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | (CIS) |
| R137 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | (CIS) |
| R141 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R142 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R143 | 1-247-791-91 | CARBON | 22 | 5% | 1/4W | |
| R161 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R162 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| R163 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| R171 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R181 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R191 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R201 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R202 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R203 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R204 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R205 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R206 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R207 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R208 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R209 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R210 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R212 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R213 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R214 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R215 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W | |
| R216 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R217 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R222 | 1-247-893-11 | CARBON | 390K | 5% | 1/4W | |
| R224 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R225 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R226 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R227 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R228 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W | |
| R229 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R230 | 1-247-807-31 | CARBON | 100 | 5% | 1/4W | |
| R231 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R271 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R281 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R282 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R283 | 1-249-393-11 | CARBON | 10 | 5% | 1/4W | |
| R284 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

# MAIN PANEL

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R285 | 1-249-393-11 | CARBON 10 5% | 1/4W |
| R301 | 1-249-441-11 | CARBON 100K 5% | 1/4W<br>(AEP, G, IT, UK) |
| R302 | 1-249-441-11 | CARBON 100K 5% | 1/4W<br>(AEP, G, IT, UK) |
| R303 | 1-249-441-11 | CARBON 100K 5% | 1/4W<br>(AEP, G, IT, UK) |
| R304 | 1-249-441-11 | CARBON 100K 5% | 1/4W<br>(AEP, G, IT, UK) |
| R305 | 1-249-429-11 | CARBON 10K 5% | 1/4W<br>(AEP, G, IT, UK) |
| R306 | 1-249-426-11 | CARBON 5.6K 5% | 1/4W<br>(AEP, G, IT, UK) |
| R308 | 1-249-421-11 | CARBON 2.2K 5% | 1/4W<br>(AEP, G, IT, UK) |

< VARIABLE RESISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| RV1 | 1-238-601-11 | RES, ADJ, CARBON 22K | |
| RV2 | 1-238-600-11 | RES, ADJ, CARBON 10K | |

< TERMINAL >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| TM1 | 1-537-488-11 | TERMINAL BOARD (ANTENNA) | (AEP, G, IT, UK, CIS) |
| TM1 | 1-537-238-21 | TERMINAL BOARD (ANTENNA) | (E, EA, TH) |

< VIBRATOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| X201 | 1-579-175-11 | VIBRATOR, CERAMIC (10MHz) | |
| X202 | 1-567-098-41 | VIBRATOR, CRYSTAL (32.768KHz) | |
| X301 | 1-579-900-21 | VIBRATOR, CRYSTAL (4.332MHz) | (AEP, G, IT, UK) |
| XT51 | 1-760-549-11 | VIBRATOR, CRYSTAL (4.5MHz) | |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | A-4378-851-A | PANEL BOARD, COMPLETE | (E, EA, TH) |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | A-4378-864-A | PANEL BOARD, COMPLETE | (AEP, G, IT, UK, CIS) |

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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 4-979-798-01 | HOLDER (FL) | |

< CAPACITOR >

| Ref. No. | Part No. | Description | | | |
|---|---|---|---|---|---|
| C601 | 1-126-933-11 | ELECT | 100uF | 20% | 10V |
| C602 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V |
| C603 | 1-104-667-11 | ELECT | 22uF | 20% | 35V |
| C604 | 1-164-159-21 | CERAMIC | 0.1uF | | 50V |
| C605 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C606 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C607 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C608 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C609 | 1-162-294-31 | CERAMIC | 0.001uF | 10% | 50V |
| C610 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C611 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C612 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C613 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C614 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C615 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C616 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C617 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C618 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C619 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C620 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C621 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C622 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C623 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C624 | 1-162-282-31 | CERAMIC | 100PF | 10% | 50V |
| C625 | 1-136-173-00 | FILM | 0.47uF | 5% | 50V |
| C626 | 1-136-173-00 | FILM | 0.47uF | 5% | 50V |

< CONNECTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * CN601 | 1-568-864-11 | SOCKET, CONNECTOR 21P | |

< DIODE >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| D601 | 8-719-046-44 | DIODE SEL5221S (ENTER/NEXT) | |
| D602 | 8-719-046-46 | DIODE SEL5221S-TH8F (MULTI CONTROLLER) | |
| D603 | 8-719-046-43 | DIODE SEL5421E-TP15 (SLEEP) | |
| D604 | 8-719-046-44 | DIODE SEL5221S (REC) | |
| D605 | 8-719-046-43 | DIODE SEL5421E-TP15 (DAILY) | |
| D606 | 8-719-046-43 | DIODE SEL5421E-TP15 (ONCE) | |

< FLUORESCENT INDICATOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| FL601 | 1-517-368-11 | INDICATOR TUBE, FLUORESCENT | |

< IC >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| IC601 | 8-759-261-63 | IC M66004M6FP | |

< COIL >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| L601 | 1-414-189-31 | INDUCTOR 100uH | |
| L602 | 1-414-189-31 | INDUCTOR 100uH | |

< TRANSISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| Q601 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| Q602 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |

< RESISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R601 | 1-249-413-11 | CARBON 470 5% | 1/4W |
| R602 | 1-249-415-11 | CARBON 680 5% | 1/4W |
| R603 | 1-249-417-11 | CARBON 1K 5% | 1/4W |
| R604 | 1-249-419-11 | CARBON 1.5K 5% | 1/4W |
| R605 | 1-249-421-11 | CARBON 2.2K 5% | 1/4W |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R606 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R607 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R608 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R609 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R610 | 1-249-419-11 | CARBON 1.5K 5% 1/4W | |
| R611 | 1-249-421-11 | CARBON 2.2K 5% 1/4W | |
| R612 | 1-249-425-11 | CARBON 4.7K 5% 1/4W | |
| R613 | 1-249-415-11 | CARBON 680 5% 1/4W | |
| R614 | 1-247-815-91 | CARBON 220 5% 1/4W | |
| R615 | 1-247-815-91 | CARBON 220 5% 1/4W | |
| R616 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R617 | 1-249-429-11 | CARBON 10K 5% 1/4W | |
| R618 | 1-249-413-11 | CARBON 470 5% 1/4W | |
| R620 | 1-247-807-31 | CARBON 100 5% 1/4W | |
| R621 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R622 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R623 | 1-249-417-11 | CARBON 1K 5% 1/4W | |
| R624 | 1-249-434-11 | CARBON 27K 5% 1/4W | |
| R625 | 1-249-429-11 | CARBON 10K 5% 1/4W | |

< SWITCH >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| S601 | 1-554-303-21 | SWITCH, TACTILE (AEP, G, IT, UK:EON)<br>(E, EA, TH, CIS:MEMORY) | |
| S602 | 1-554-303-21 | SWITCH, TACTILE (AEP, G, IT, UK:PTY)<br>(E, EA, TH, CIS:STEREO/MONO) | |
| S603 | 1-554-303-21 | SWITCH, TACTILE (DISPLAY) | |
| S604 | 1-554-303-21 | SWITCH, TACTILE (SLEEP) | |
| S605 | 1-554-303-21 | SWITCH, TACTILE (REC) | |
| S606 | 1-554-303-21 | SWITCH, TACTILE (DAILY) | |
| S607 | 1-554-303-21 | SWITCH, TACTILE (TIMER SET) | |
| S608 | 1-554-303-21 | SWITCH, TACTILE (ENTER/NEXT) | |
| S609 | 1-554-303-21 | SWITCH, TACTILE (TUNER/BAND) | |
| S610 | 1-554-303-21 | SWITCH, TACTILE (AEP, G, IT, UK:MEMORY)<br>(E, EA, TH, CIS:PRESET) | |
| S611 | 1-554-303-21 | SWITCH, TACTILE (E, EA, TH, CIS:AUTO)<br>(AEP, G, IT, UK:TUNING MODE) | |
| S612 | 1-554-303-21 | SWITCH, TACTILE (E, EA, TH, CIS:MANUAL)<br>(AEP, G, IT, UK:STEREO/MONO) | |
| S613 | 1-554-303-21 | SWITCH, TACTILE (CHARACTER) | |
| S614 | 1-554-303-21 | SWITCH, TACTILE (CLOCK SET) | |
| S615 | 1-473-403-11 | ENCODER, ROTARY (MULTI CONTROLLER) | |
| S616 | 1-554-303-21 | SWITCH, TACTILE (ONCE) | |

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* A-4389-480-A POLAR BOARD, COMPLETE (CIS)

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< CAPACITOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| C1701 | 1-162-294-31 | CERAMIC 0.001uF 10% 50V | (CIS) |
| C1702 | 1-130-014-00 | FILM 470PF 5% 50V | (CIS) |
| C1703 | 1-124-902-00 | ELECT 0.47uF 20% 50V | (CIS) |
| C1704 | 1-124-902-00 | ELECT 0.47uF 20% 50V | (CIS) |
| C1705 | 1-101-006-00 | CERAMIC 0.047uF 50V | (CIS) |
| C1706 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1707 | 1-162-288-31 | CERAMIC 330PF 10% 50V | (CIS) |
| C1710 | 1-137-364-11 | FILM 0.001uF 5% 50V | (CIS) |
| C1711 | 1-137-364-11 | FILM 0.001uF 5% 50V | (CIS) |
| C1712 | 1-130-736-11 | FILM 0.01uF 5% 50V | (CIS) |
| C1713 | 1-130-736-11 | FILM 0.01uF 5% 50V | (CIS) |
| C1714 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1715 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1716 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1719 | 1-126-967-11 | ELECT 47uF 20% 16V | (CIS) |
| C1720 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | (CIS) |
| C1723 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | (CIS) |
| C1724 | 1-162-306-11 | CERAMIC 0.01uF 30% 16V | (CIS) |
| C1725 | 1-126-967-11 | ELECT 47uF 20% 16V | (CIS) |
| C1726 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1727 | 1-124-903-11 | ELECT 1uF 20% 50V | (CIS) |
| C1728 | 1-126-966-11 | ELECT 33uF 20% 16V | (CIS) |

< CONNECTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * CN1701 | 1-568-832-11 | SOCKET, CONNECTOR 13P (CIS) | |

< TRIMMER >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| CT1701 | 1-141-260-00 | CAP, TRIMMER 50PF (CIS) | |

< DIODE >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| D1701 | 8-719-815-85 | DIODE 1S1585 (CIS) | |
| D1703 | 8-719-815-85 | DIODE 1S1585 (CIS) | |
| D1704 | 8-719-815-85 | DIODE 1S1585 (CIS) | |
| D1705 | 8-719-815-85 | DIODE 1S1585 (CIS) | |

< IC >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| IC1701 | 8-759-063-04 | IC IR3R42 (CIS) | |
| IC1703 | 8-759-140-53 | IC uPD4053BC (CIS) | |

< COIL >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| L1701 | 1-409-497-11 | COIL (FILTER) (CIS) | |

< TRANSISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| Q1701 | 8-729-029-21 | TRANSISTOR DTA114ESA-TP (CIS) | |
| Q1702 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (CIS) | |
| Q1704 | 8-729-029-67 | TRANSISTOR DTC114ESA-TP (CIS) | |

< RESISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R1701 | 1-249-432-11 | CARBON 18K 5% 1/4W | (CIS) |
| R1702 | 1-249-435-11 | CARBON 33K 5% 1/4W | (CIS) |
| R1703 | 1-249-427-11 | CARBON 6.8K 5% 1/4W | (CIS) |
| R1704 | 1-247-858-11 | CARBON 13K 5% 1/4W | (CIS) |

**POLAR**

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| R1705 | 1-249-417-11 | CARBON 1K 5% 1/4W | (CIS) |
| R1706 | 1-249-417-11 | CARBON 1K 5% 1/4W | (CIS) |
| R1707 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
| R1708 | 1-249-440-11 | CARBON 82K 5% 1/4W | (CIS) |
| R1709 | 1-249-439-11 | CARBON 68K 5% 1/4W | (CIS) |
| R1710 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1711 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1714 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | (CIS) |
| R1715 | 1-249-426-11 | CARBON 5.6K 5% 1/4W | (CIS) |
| R1716 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
| R1717 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |
| R1718 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1719 | 1-249-429-11 | CARBON 10K 5% 1/4W | (CIS) |
| R1721 | 1-249-434-11 | CARBON 27K 5% 1/4W | (CIS) |
| R1722 | 1-249-441-11 | CARBON 100K 5% 1/4W | (CIS) |

< VARIABLE RESISTOR >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| RV1701 | 1-238-600-11 | RES, ADJ, CARBON 10K | (CIS) |
| RV1702 | 1-238-599-11 | RES, ADJ, CARBON 4.7K | (CIS) |

< TEST PIN >

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * TP1701 | 1-560-061-00 | PIN, CONNECTOR 3P | (CIS) |
| * TP1702 | 1-560-061-00 | PIN, CONNECTOR 3P | (CIS) |

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MISCELLANEOUS
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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 15 | 1-773-144-11 | WIRE (FLAT TYPE)(21 CORE) | |
| 17 | 1-751-688-11 | WIRE (FLAT TYPE)(13 CORE) | (CIS) |
| FL601 | 1-517-368-11 | INDICATOR TUBE, FLUORESCENT | |

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ACCESSORIES & PACKING MATERIALS
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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| * | 4-980-539-01 | CUSHION (UPPER) | |
| * | 4-980-540-01 | CUSHION (LOWER) | |

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HARDWARE LIST
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| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| #1 | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2 N-S | |
| #2 | 7-685-647-79 | SCREW +BVTP 3X10 TYPE2 N-S | |

9-960-499-11

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96B0978-1
Printed in Japan
© 1996. 2
Published by Home A&V Products Div.
Quality Engineering Dept.

# ST-EX100

**SONY**

# SERVICE MANUAL

AEP Model
UK Model
E Model

## SUPPLEMENT-1

File this supplement with the service manual.

**Subject: SERVICING NOTE ADDITION**

**Switching the Channel Step 9 kHz/10 kHz**

1. Turn off the power of the unit.
2. While pressing the ENTER/NEXT button, press the SYSTEM POWER button of the amplifier section to turn on the power.

The value switches between 9 kHz and 10 kHz steps each time the above is carried out.

**NOTE:**
1) Take note not to switch the above when not required.
2) This switching cannot be performed when power is supplied using service box (PFJ-1).

97B0473-1
Printed in Japan
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Engineering Dept. (Shibaura)**

**Sony Corporation**
**Home A&V Products Company**

9-960-499-81